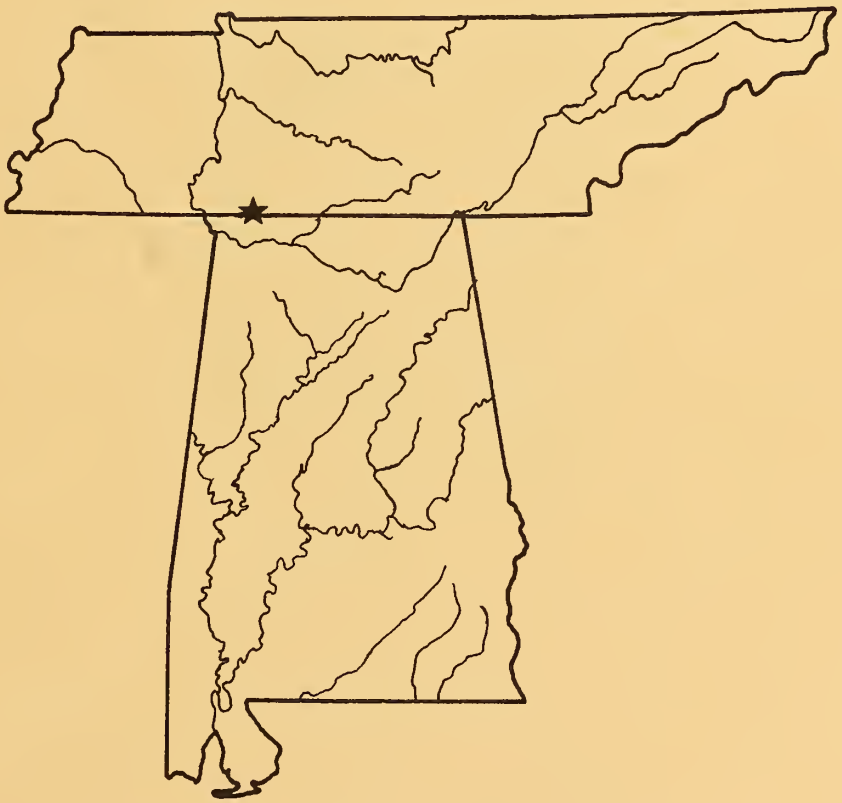
FINAL ENVIRONMENTAL IMPACT STATEMENT FOR CYPRESS CREEK WATERSHED



LAUDERDALE COUNTY, ALABAMA
AND
WAYNE COUNTY, TENNESSEE

JANUARY 1976

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Cypress Creek Watershed
Lauderdale County, Alabama and Wayne County, Tennessee

FINAL ENVIRONMENTAL IMPACT STATEMENT

William B. Lingle
State Conservationist
Soil Conservation Service

Sponsoring Local Organizations:

Cypress Creek Watershed Conservancy District
Douglas C. Austin, Chairman
Route 1
Cloverdale, Alabama 35617

Lauderdale County Commission
William B. Duncan, Chairman
Lauderdale County Courthouse
Florence, Alabama 35630

Lauderdale County Soil and Water Conservation District
William H. Jones, Chairman
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Florence, Alabama 35630

Three Cypress Creek Watershed District
Ben Berry, Chairman
Collinwood, Tennessee 38450

Wayne County Soil Conservation District
Roy Bromley, Chairman
Route 3
Waynesboro, Tennessee 35485

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January 1976

Prepared By

UNITED STATES DEPARTMENT OF AGRICULTURE
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Wayne County, Tennessee

Prepared in Accordance With
Sec. 102(2)(C) of P. L. 91-190

Summary

I Final

II Soil Conservation Service

III Administrative

IV Project Purpose and Action: A project for watershed protection and flood prevention in Lauderdale County, Alabama and Wayne County, Tennessee is to be implemented under authority of the Watershed Protection and Flood Prevention Act (P. L. 566, 83rd Congress, 68 Stat. 666), as amended.

The project proposal includes an accelerated conservation land treatment program, 19 floodwater retarding structures, and 14.4 miles of channel work. All streams on which channel work is planned are perennial with 14 miles of natural channels and 0.4 miles of previously modified channel. Type of work planned includes bedload removal, clearing and shaping, and new channel excavation. The project will reduce floodwater damages, erosion, and sediment.

V Summary of Environmental Impacts: The environmental impacts of the proposed project are; reduce average gross erosion rates by 10 percent, stabilize 60 acres having critical erosion problems, reduce downstream sediment delivery by 47 percent, reduce flood damages by 75 percent, increase net income of farm operators, generate additional employment, boost economic activity, and create additional habitat for waterfowl. Floodwater retarding structures and channel work will destroy some habitat for several species of fish that inhabit springs and spring-fed branches. Bedload removal and other channel work will have temporary adverse effects on the habitat of one amphibian and several species of mollusks. There will be about 427 acres of land cleared for the sediment pools, the dam and spillway areas, and along the channel work rights-of-way. There will be either a loss or reduced production from 1,340 acres of pasture and row crops and 785 acres of forest land within the detention pools. In addition, there will be a loss of 208 acres of wildlife habitat on lands to be in the sediment pools and there will be some temporary water and air pollution during construction stages.

VI Alternatives Considered in Project Development:

1. Accelerated Conservation Land Treatment Measures
2. Accelerated Conservation Land Treatment and Flood Plain Zoning
3. Accelerated Conservation Land Treatment and Nineteen Floodwater Retarding Structures with Flowage Easements
4. Accelerated Conservation Land Treatment, Nineteen Floodwater Retarding Strucures, and 50.3 Miles of Channel Excavation
5. Accelerated Conservation Land Treatment, Nineteen Floodwater Retarding Structures 11 Miles of Channel Excavation, and 45 Miles of Channel Clearing and Shaping
6. Accelerated Conservation Land Treatment, Nineteen Floodwater Retarding Structures, 11 Miles of Channel Excavation, and 7 Miles of Channel Clearing and Shaping
7. No Project

VII Agencies, Groups, and Individuals From Which Written Comments on the Draft Environmental Impact Statement Were Received:

1. Department of the Army
   Office of the Assistant Secretary, Washington, D.C.
   Corps of Engineers (District), Nashville, Tennessee
2. Department of Health, Education, and Welfare
3. Department of Housing and Urban Development
4. Department of the Interior
5. Department of Transportation
6. Environmental Protection Agency
   Administrator, Washington, D. C.
   Regional Administrator, Atlanta, Georgia
7. Tennessee Valley Authority
   Director, Water Control Planning, Knoxville, Tennessee
   Director, Division of Agricultural Development, Muscle Shoals, Alabama
   Director of Environmental Planning, Chattanooga, Tennessee
8. The Attorney General, State of Alabama
9. Alabama Development Office
   Alabama Department of Conservation and Natural Resources
   Alabama Historical Commission
   Alabama State Soil and Water Conservation Committee (Agency designated by Governor of Alabama)
10. Alabama State Highway Department
11. State of Tennessee Office of Urban and Federal Affairs (Agency designated by Governor of Tennessee)
    Tennessee Department of Agriculture
    Tennessee Department of Conservation
    Tennessee Department of Public Health
    Tennessee Historical Commission
    Tennessee Wildlife Resources Agency

12. Agricultural Experiment Station, University of Tennessee
13. Alabama Archaeological Society
14. The Wildlife Society
    National Office, Washington, D. C.
    Tennessee Chapter, Nashville, Tennessee
15. Mr. Bob Truett, Birmingham, Alabama

VIII Draft Statement Transmitted to CEQ on March 28, 1975.

USDA SOIL CONSERVATION SERVICE

FINAL ENVIRONMENTAL IMPACT STATEMENT*

for

Cypress Creek Watershed
Lauderdale County, Alabama
Wayne County, Tennessee

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83rd Congress, 68 Stat. 666, as amended.

Sponsoring Local Organization

Cypress Creek Watershed Conservancy District
Lauderdale County Commission
Lauderdale County Soil and Water Conservation District
Three Cypress Creek Watershed District
Wayne County Soil Conservation District
University of North Alabama

* All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service and Forest Service, U. S. Department of Agriculture. References cited are listed at the end of each major section of this document.

PROJECT PURPOSES AND GOALS

Meetings were held with the sponsors to discuss their problems, possible solutions, watershed resource development needs, and the formulation of project objectives.

The objectives selected were those that would contribute to the conservation, development, and productive use of the watershed soil, water, and related resources so that the watershed residents may--improve their standard of living through community improvement and adequate income; conserve and protect the natural resources for future generations; and to improve mans environment in which to live, work, and play.

The goals for the project are:

1. To use the land within its capabilities and the establishment and maintenance of necessary land treatment measures which will reduce soil loss to a rate that will permit a high level of productivity to be sustained economically and indefinitely.

2. Provision of a level of protection which will reduce floodwater, erosion and sediment damages to a rate which will allow the productivity of the land to be sustained economically and indefinitely. The landowners stated that they plan to convert more of the flood plain into cropland and pastureland with flood protection. They also indicated that they plan to manage the flood plain lands at a higher level since the threat of flooding and damages will be reduced.

3. Preservation, improvement and the minimizing of adverse effects to the fish and wildlife resources.

4. Stimulation of the economic development of the area as a result of project installation.

It was agreed that these objectives and goals were reasonable and consistant with water and related land resource conservation and development.

PLANNED PROJECT

Land Treatment Measures

Conservation land treatment is a basic element in a watershed program. It is defined as applying management, cultural, and structural practices in such a manner that the land is used within its capabilities and soil losses from erosion are held to acceptable levels. Land treatment is accomplished primarily through the development and implementation of conservation plans and forest management plans on individual farms.

Technical assistance to landowners and land users will be available from the Soil Conservation Service (SCS) through the Lauderdale County Soil and Water Conservation District in Alabama and the Wayne County Soil Conservation District in Tennessee. Technical assistance will be available for soils surveys, conservation planning, implementing conservation plans, and guidance in maintaining conservation measures and practices after application. 1/

Soil surveys are the basic inventories used in developing land use and treatment alternatives. 2/ SCS provides technical assistance in preparing the soil surveys needed for planning and applying land treatment measures.

A soil survey is complete for Lauderdale County, Alabama. It is scheduled for publication in 1976. Until then, soils information is available from the SCS field office in Florence, Alabama.

A complete soil survey has not been made in the Wayne County, Tennessee, portion of the watershed. Soil maps have been made for most of the units of land that have conservation plans with the Wayne County Soil Conservation District. Technical assistance will be provided by SCS in preparing soil surveys for conservation plans that are to be completed during the 10-year watershed installation period. It is expected that soil surveys will be needed on 30,000 acres of Wayne County, Tennessee, during the 10-year installation period.

Conservation plans are documents to guide deliberate actions in accomplishing land treatment. 3/ Conservation planning involves using inventories for studying, evaluating, and selecting alternatives for courses of action. Conservation plans are tailored for particular units of land by the landowners or landusers with the help of the SCS soil conservationist. 4/ The soil conservationist provides technical material and information that are needed in making decisions on soils, water, animals, plants, and related resources. Landowners and landusers make the decisions.

Conservation plans outline appropriate uses for each acre of land and the conservation measures and treatments needed for sustained production and protection. 5/ The landowner makes arrangements to implement the plan. The SCS, upon request, provides technical assistance in installing the conservation practices. This assistance normally involves site investigation, design, layout and supervising the construction of farm ponds, drainage ditches, terraces, diversions, waterways, and other structural practices. Less complex practices such as contour farming usually require only minor surveys for layout work.

SCS also provides technical assistance in maintaining practices after they are applied. This assistance usually involves only consultation and minor surveys. Technical assistance is provided to landowners and landusers throughout the watershed.

Land treatment which results from the technical assistance provided in planning and applying conservation practices is entirely voluntary on the part of landowners and landusers. It is expected that during the 10-year installation period, 477 new plans covering about 57,000 acres will be made and that 81 of the existing plans will be revised.

Conservation land treatment is expected to be applied on 6,000 acres of cropland and 10,050 acres of grassland by the end of the installation period. These amounts represent almost nine times as much cropland and almost two times as much grassland as are presently treated. Conservation land treatment is planned on 170 acres of wildlife land.

Conservation land treatment, except for severely eroded critical areas, was not planned for exact locations when formulating the watershed work plan. Critical areas causing severe downstream sedimentation were delineated and located in appendix G.

Conservation land treatment can be accomplished by applying a combination of practices that are suited to the soil, to land use, and to the landuser's desires. Different combinations of practices can be applied on similar soils. Many conservation practices are used in land treatment. However, past experience and present trends indicate that about ten major practices will be most significant in accomplishing the land treatment program.

The Alabama Forestry Commission and the Tennessee Division of Forestry, cooperating with the U. S. Forest Service, will provide technical assistance on forest lands in the watershed. Conservation practices are expected to be applied on 5,700 acres of forest lands during the 10-year installation period. They are tree planting--2,000 acres and stand improvement--3,700 acres. Cooperative forest fire control will be improved on all forest land in the watershed.

Public Law 566 funds will be provided to assist in accelerating technical assistance, and purchasing one fire fighting truck with removable pumper equipment. The truck and equipment will be operated by the Alabama Forestry Commission. A fire contactor program will be initiated in Tennessee. Landowners or landusers will furnish other tools, equipment, and money which are necessary for treatment of their forest lands.

Conservation practices anticipated to be applied on portions of the 6,000 acres of cropland, 10,050 acres of grassland, 5,700 acres of forest land, and 170 acres of wildlife land during the installation period are:

Diversions
Grassed waterways
Field borders
Conservation cropping systems
Drainage field ditches
Drainage mains and laterals
Pasture and hayland planting
Forest land management
Tree planting
Stand improvement
Intensified fire protection
Pasture and hayland management
Ponds
Wildlife upland habitat management

The total amount applied will be contingent upon decisions of landowners and operators. Additional practices will be applied to areas that are not considered adequately treated. Conservation practices will be applied on sloping, upland croplands primarily to reduce soil erosion and water losses from surface runoff. 6/

Diversions will be applied to reduce the slope of fields and to collect and safely remove water. They are often used near the base of steep slopes to protect less sloping cropland below.

Grassed waterways are natural or constructed water outlets that are established in perennial sod-forming vegetation. They provide safe disposal of concentrated runoff water from fields, diversions, terraces, and other structures.

Field borders are strips of perennial vegetation at the edges of fields. They are effective in trapping sediment from row crop fields, reducing runoff water, facilitating the use of farm equipment, and providing food, shelter, and travel lanes for wildlife.

Conservation cropping systems are combinations of cultural and management measures that are effective in maintaining good soil conditions and

in reducing soil and water losses. They include the use of sod crops in rotation, especially on soils that are subject to high rates of erosion. Conservation cropping systems protect flood plains from scour during flooding.

Conservation practices will be applied on croplands in the flood plains primarily to reduce water damages to crops and to facilitate field operations. 6/

Drainage field ditches and drainage mains and laterals are open ditches constructed to designed grades and sizes. Their purposes are to dispose of excessive surface or subsurface water, intercept ground water, or control ground water levels. Excessive ponded water or ground water interferes with tillage, planting, and harvest operations.

Conservation practices applied on grassland will result in rapid protective cover on the land, provide livestock water, and high quality hayland grazing for livestock.

Pasture and hayland planting is the establishment or re-establishment of fields to long-term stands of forage plants. The purposes of these practices are to reduce erosion, to improve the composition of pasture and hay plants, and to use the land within its capabilities.

Pasture and hayland management includes management and cultural measures that result in proper treatment and proper use of pasture and hayland. Its purposes are to prolong the life of desirable forage, maintain or improve the quality and quantity of forage to prevent soil erosion, and to reduce water losses.

Ponds are made by building dams across watercourses or by excavating pits. Ponds provide water for livestock and for fish and wildlife.

Wildlife upland habitat management includes retaining, creating, and maintaining wildlife habitat on uplands. This practice includes management techniques for both game and non-game animals. For example, an area which contains a variety of trees, shrubs, vines, and other plants that provide food, and other needs of wildlife can be retained and managed. Some of the commonly used techniques are planting food plots, retaining portions of agricultural crops, and creating openings in forest land.

Other conservation practices such as minimum tillage may become important before the end of the installation period. If so, they will replace some of the practices discussed above.

About 57 critically eroding areas (see appendix G) covering 60 acres will be stabilized during the installation period. These include about 10 acres of bare, critical roadbanks and about 50 acres of critically eroded gullies and borrow pits.

Critical areas will be shaped to workable slopes and perennial grasses and legumes will be established on them. These will include sericea, common bermudagrass, and tall fescue.

Treatment of critical areas will be a cooperative effort. SCS will provide technical assistance in planning and applying the treatment. For gullies and borrow pits, SCS will also provide funds for shaping and for lime, fertilizer, seed, and mulch. Through a cooperative agreement with landowners, the local sponsors will prepare seedbeds; apply lime, fertilizer, and seed; and do the necessary repair. For critical roadbanks, SCS will provide funds for contracting the vegetative work; the local sponsors will do the shaping needed to establish the vegetation.

Tree planting consists of planting both open lands and understocked stands of trees. This practice develops a cover of absorbent litter on the forest floor and reduces runoff and erosion.

Stand improvement consists of operations such as removal of inferior species and cull trees and harvest cuttings. These operations improve hydrologic conditions and create favorable conditions for production and protection of litter, humus, and forest cover.

Forest management plans will be developed on about 5,700 acres of forest land. These plans will be for forest management, wildlife habitat, watershed protection, and environmental enhancement.

Structural Measures

A system of 19 floodwater retarding structures and 14.4 miles of channel work is planned for construction during the 10-year installation period. This system of structures will provide protection to the flood plain lands of the watershed. The location of the planned structural measures is shown on the project map (see appendix C). Appropriate federal permits that may be needed pursuant to section 404 of Public Law 92-500 will be obtained by the sponsoring organization at the appropriate time.

Floodwater Retarding Structures

Runoff from about 50 percent of the drainage area above the confluence of Cox Creek and Cypress Creek will be retarded by the structures.

These structures will store floodwater temporarily and release it at a rate that will reduce downstream flooding.

The total capacity allocated for the anticipated 100-year accumulation of sediment is 5,762 acre-feet. The principal spillways of structures Nos. 9, 13, 18, 19, and 21 will have single-stage risers (see appendix K). The crest of these principal spillways will be set at the 50-year sediment level except site No. 9 which will be set at the 100-year level. Maximum releases for any storm are about 20 to 26 csm of drainage area. The principal spillways of the remaining structures, 1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 15, 16, 17, and 20 will have two-stage risers (see appendix L). The crest of the low stage on these principal spillways will be set at the 50-year sediment level.

The maximum low stage release flows will range from 15.8 to 19.3 cubic feet per second per square mile of drainage area controlled (csm). The maximum high-stage release flows will range from 28.7 to 59.5 csm.

The principal spillways for all the structures will be drop inlet type and will operate automatically. All of the structures will have a slide gate in the base of the principal spillway riser. The slide gate will allow the passing of streamflow and storm runoff during construction and the release of impounded floodwater in order to perform maintenance as needed. All structures will be built on yielding foundations with drains in each to provide both internal and foundation drainage.

The total floodwater retarding capacity in the floodwater retarding structures is 31,554 acre-feet. This storage, combined with the principal spillway capacity for all structures, will provide protection to the emergency spillway. The emergency spillways of each structure will function on the average of once in 50 years after construction except for structure Nos. 18, 19, and 20. The emergency spillways of these structures will function less frequent than other structures.

A water level control gate will be installed in structures Nos. 6, 10, 15, 16, 17, 18, and 19 to permit seasonal variation (2 to 4 feet) of the water levels to provide food for wildlife and waterfowl. These gates will require operation by the sponsors. Cool water outlets will be installed in structures Nos. 1, 2, 3, 5, 6, 7, 10, 11, 18, 19, and 21 to maintain stream temperatures as close to before project conditions as possible. These outlets will be ungated, installed on the principal spillway risers and will operate automatically. Technical assistance through the ongoing program of SCS will be available for assisting in managing the floodwater retarding structures for wildlife.

The dams will be constructed of compacted earth. They will have an upstream berm (see appendix K and L) located at the normal pool level to prevent erosion from waves and to increase dam stability. A plunge pool or other type energy dissipator will be installed at the outlet of the principal spillway to reduce the energy of the water to a non-erosive velocity before it enters the downstream channel. Each structure will have an earthen emergency spillway which will pass flow in excess of detention storage capacity and planned principal spillway releases. Sediment pools and shoreline depths are to be deepened to meet State Health Department regulations for vector control. Other state laws pertaining to impoundments will be followed.

Preliminary site investigations indicate that all needed borrow for the embankments should be obtainable from the emergency spillway areas and from within the sediment pool areas. The borrow materials are generally inorganic silts (ML's), silty-sands (SM's), silty gravels (GM's), and clayey gravels (GC's). If secondary borrow areas are needed they will come from the shoreline deepening areas.

Installation of the floodwater retarding structures will require 3,066 acres of land. This area consists of 1,152 acres of forest land and 1,914 acres of pasture and row crops. Construction of the dams and emergency spillways and the borrow areas will require 420 acres of this land, which includes 159 acres of forest land and 261 acres of pasture and row crops. The sediment pools, which will initially impound water, will inundate 521 acres, which includes 208 acres of forest land and 313 acres of pasture and row crops. The retarding pools will temporarily inundate 2,125 acres, which includes 785 acres of forest land and 1,340 acres of pasture and row crops.

The areas needed for construction of the dams, emergency spillways, and borrow areas will be cleared of all existing vegetation. In addition, woody vegetation within the sediment pool areas below the elevation of the lowest stage of the principal spillway riser will be cleared to the amount needed for the adequate and safe performance and operation of the floodwater retarding structures and to create a practical and reasonable maintenance condition. The precise area to be cleared will be determined during the installation phase at each site. The dams, emergency spillways, and all disturbed areas, except water impoundment areas, will be vegetated with adaptable multiuse plants for erosion control and wildlife use (see table 1).

The following alterations, modifications, or change in locations of existing improvements will be necessary: (1) either raising or rerouting of county roads in flood pools of structures Nos. 9, 11, 13, and 20, (2) either raising or relocating utility lines near structures No. 9, 11, 12, 13, 16, and 20, and (3) removal of abandoned houses, barns, or sheds near structures No. 13, 16, 20, and 21.

TABLE 1

VEGETATIVE COVER FOR STRUCTURAL MEASURES
CYPRESS CREEK WATERSHED
Lauderdale County, Alabama and Wayne County, Tennessee

LOCATION	SEASON	VEGETATION
Dams, emergency spillways, borrow areas*, & adjacent disturbed areas such as borders, etc.	Early spring to late summer	Common bermuda or Weeping love grass and Sericea lespedeza
Dams, emergency spillways, borrow areas*, & adjacent disturbed areas such as borders, etc.	Fall	Tall fescue, White clover, Bermuda grass and Sericea lespedeza
Excavated channel side slopes, berms*, and spoil*.	Early spring to late summer	Common Bermuda grass, Sericea lespedeza and Tall fescue
Disturbed channel side slopes, berms*, and spoil*.	Fall	Common Bermuda grass, Sericea lespedeza and Tall fescue

* Trees, including pine and hardwood, will be planted at selected locations during fall and winter.

Under present conditions the acquisition of land rights needed for installation will result in the following displacements: (1) Site No. 2 will require relocation of an owner-occupied trailer, which will displace three people, (2) Site No. 3 involves the relocation of one person in a tenant-occupied home. The house is a small frame structure with no bath and no running water, (3) Site No. 6 will require the relocation of a cabinet shop business which is located on a farm, (4) Site No. 9 will require the relocation of two people from an owner-occupied home. The home is a weather boarded, two-story structure with one bath, (5) Site No. 13 will require relocation of a hog farming operation. Displaced facilities include a lagoon, holding pen, farrowing stall, and one "feed-out" barn, (6) Site No. 16 will require relocation of a tenant house. This is a small frame house with one bath, (7) Site No. 20 will require relocation of five people in an owner-occupied frame house with one bath, (8) Site No. 21 will require relocation of a fish farming operation. Involved are five surface acres of catfish ponds and a rainbow trout raceway.

The minimum land rights required will be those necessary to construct, operate, maintain, and inspect the structure sites; to provide for flowage of water in or upon or through the structures; and to provide for the permanent storage and temporary detention, either or both, of any sediment or water.

The environment will be protected from soil erosion and water and air pollution during construction. Contractors will be required to adhere to strict guidelines set forth in each construction contract to minimize soil erosion and water and air pollution during construction. Excavation and construction operations will be scheduled and controlled to prevent exposure of excessive amounts of unprotected soil to erosion and the resulting translocation of sediment. Measures to control erosion will be uniquely specified at each work site and will include, as applicable, use of temporary vegetation or mulches, diversions, mechanical retardation of runoff, and traps. Motors of construction equipment will be required to have mufflers to reduce noise. Harmful dust and other pollutants inherent to the construction process will be held to minimum practical limits. Haul roads and excavation areas and other work sites will be sprinkled with water as needed to keep dust within tolerable limits. Contract specifications will require that fuel, lubricants, and chemicals be adequately labeled and stored safely in protected areas, and disposal at work sites will be by approved methods and procedures. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable laws, ordinances, and regulations in respect to burning. Each contract will set forth specific stipulations to prevent uncontrolled grass or brush fires. Disposal of brush and vegetation will be by burying, hauling to approved off-site locations, or by controlled burning, as applicable.

Necessary sanitary facilities, including garbage disposal facilities, will be located to prohibit such facilities being injuriously adjacent to live streams, wells, or springs in conformance with federal, state, and local water pollution control regulations. Conformance to all environmental control requirements will be monitored constantly by a construction inspector who will be on-site during all periods of construction operation.

The environment will continue to be protected from erosion and water pollution following completion of construction. Project sponsors will operate and maintain the structural measures in accordance with a specific operation and maintenance agreement. The agreement will set forth the inspections to be made and the maintenance to be performed to prevent soil erosion and water pollution.

The sediment pools of all floodwater retarding structures are expected to hold water. The sponsors will prohibit access by the general public at each reservoir unless or until adequate sanitary facilities complying with state health laws are provided.

Table 3 shows details on quantities and design features of the structures (see following page).

Channel Work

A combination of bedload removal, clearing and shaping, and new channel excavation is planned on 14.4 miles of major streams in the watershed (see appendix C and Table 3A). Removal of bedload in three reaches of Cypress Creek (5.9 miles) and one reach of Dulin Branch (.4 miles) will provide the planned capacity to carry flood flows. Clearing and shaping in three reaches of Middle Cypress (5.0 miles), one reach of Little Cypress (0.8 miles), and one reach of Cypress (1.7 miles) will allow these channels to carry the planned capacity. New channel excavation on Threet (0.3 miles) and North Fork (0.3 miles) Creeks will connect those laterals with Cypress Main at points further upstream from present confluences. This will eliminate the need for channel work on approximately 2 miles of existing channel.

Flow conditions of the 14.4 miles of planned channel work are perennial. Approximately 0.4 miles of planned channel work is on Dulin Branch, a stream previously modified by man in 1954. The remaining 14 miles are natural channels on Cypress, Middle Cypress, Little Cypress, North Fork and Threet Creeks. The present flow of these channels is obstructed by fallen trees, gravel bars, deep bedload, and other debris. These obstructions limit the channels' ability to carry planned flood flows. Therefore, the type of obstruction determines the method of channel work for obtaining planned capacities.

TABLE 3 - STRUCTURE DATA
FLOODWATER RETARDING STRUCTURES
Cypress Creek Watershed, Alabama & Tennessee

ITEM	UNIT	FRS STRUCTURE NO. 1	2	3	5
Class of Structure		b	b	b	b
Drainage Area	Sq. Mi.	1.73	1.16	3.34	1.50
Controlled	Sq. Mi.	---	---	---	---
Curve No. (1-day (AMC II½)		81	81	80	80
Tc	Hrs.	1.07	1.21	1.81	1.18
Elevation Top of Dam	Ft.	930.4	892.0	812.9	802.1
Elevation Crest Emergency Spillway	Ft.	925.7	887.0	806.8	797.1
Elevation Crest High Stage Inlet	Ft.	921.2	881.7	800.0	790.8
Elevation Crest Low Stage Inlet	Ft.	909.2	866.1	783.1	774.7
Maximum Height of Dam	Ft.	37	41	47.9	40.6
Volume of Fill	Cu. Yds.	95250	76082	259243	105527
Total Capacity	Ac. Ft.	630	403	1137	501
Sediment Submerged 1st 50 years	Ac. Ft.	53	37	86	41
Sediment Submerged 2nd 50 years	Ac. Ft.	53	37	85	40
Sediment Aerated	Ac. Ft.	18	13	29	14
Retarding	Ac. Ft.	506	316	937	406
Between High and Low Stage	Ac. Ft.	259	174	485	217
Surface Area					
Sediment Pool	Acres	14	7	17	8
Retarding Pool	Acres	59	29	75	36
Principal Spillway					
Rainfall Volume (areal)(1-day)	In.	6.9	6.9	6.90	6.90
Rainfall Volume (areal)(10-day)	In.	12.6	12.6	12.60	12.60
Runoff Volume (10-day)	In.	8.01	8.01	7.85	7.85
Capacity of Low Stage (Max.)	cfs	28	19	54	24
Capacity of High Stage (Max.)	cfs	66	69	122	70
Frequency Operation-Emergency Spillway	% chance	2	2	2	2
Size of Conduit	Dia. (in.)	24	24	30	24
Emergency Spillway					
Rainfall Volume (ESH)(areal)	In.	8.3	8.3	8.3	8.3
Runoff Volume (ESH)	In.	6.02	6.02	5.91	5.91
Type		Veg.	Veg.	Veg.	Veg.
Bottom Width	Ft.	100	75	125	100
Velocity of Flow (Ve)	Ft./Sec.	5.2	5.5	5.8	5.6
Slope of Exit Channel	Ft./Ft.	0.035	0.035	0.033	0.034
Maximum Water Surface Elevation	Ft.	927.18	888.62	808.55	798.68
Freeboard					
Rainfall Volume (FH)(areal)	In.	16.5	16.5	16.5	16.5
Runoff Volume (FH)	In.	13.97	13.97	13.85	13.85
Velocity of Flow (Ve)	Ft./Sec.	10.5	10.9	11.8	10.8
Maximum Water Surface Elevation	Ft.	930.37	891.97	812.91	802.09
Capacity Equivalents					
Sediment Volume	In.	1.34	1.41	1.12	1.16
Retarding Volume	In.	5.48	5.10	5.26	5.08

TABLE 3 - STRUCTURE DATA
FLOODWATER RETARDING STRUCTURES
Cypress Creek Watershed, Alabama & Tennessee

ITEM	UNIT	FRS STRUCTURE NO. 6	7	8	9
Class of Structure		b	b	b	b
Drainage Area	Sq. Mi.	5.17	3.44	1.84	5.98
Controlled	Sq. Mi.	---	---	---	---
Curve No. (1-day (AMC II½)		80	80	81	79
Tc	Hrs.	2.14	2.28	1.65	2.44
Elevation Top of Dam	Ft.	734.1	729.4	675.6	719.7
Elevation Crest Emergency Spillway	Ft.	728.8	724.6	672.1	713.5
Elevation Crest High Stage Inlet	Ft.	721.5	717.4	668.4	---
Elevation Crest Low Stage Inlet	Ft.	702.1	701.2	657.1	696.6
Maximum Height of Dam	Ft.	48.1	42.4	32	43
Volume of Fill	Cu. Yds.	179117	173821	81329	190600
Total Capacity	Ac. Ft.	1674	1188	642	1870
Sediment Submerged 1st 50 years	Ac. Ft.	100	89	56	137
Sediment Submerged 2nd 50 years	Ac. Ft.	100	88	56	273 1/
Sediment Aerated	Ac. Ft.	34	30	19	47
Retarding	Ac. Ft.	1440	981	511	1550
Between High and Low Stage	Ac. Ft.	750	499	276	---
Surface Area					
Sediment Pool	Acres	21	19	15	48
Retarding Pool	Acres	112	79	64	144
Principal Spillway					
Rainfall Volume (areal)(1-day)	In.	6.90	6.9	6.9	6.9
Rainfall Volume (areal)(10-day)	In.	12.60	12.6	12.6	12.6
Runoff Volume (10-day)	In.	7.85	7.85	8.01	7.70
Capacity of Low Stage (Max.)	cfs	84	55	30	113
Capacity of High Stage (Max.)	cfs	184	116	104	---
Frequency Operation-Emergency Spillway	% chance	2	2	2	2
Size of Conduit	Dia. (in.)	36	30	30	30
Emergency Spillway					
Rainfall Volume (ESH)(areal)	In.	8.3	8.3	8.3	8.3
Runoff Volume (ESH)	In.	5.91	5.91	6.02	5.78
Type		Veg.	Veg.	Veg.	Veg.
Bottom Width	Ft.	250	200	200	200
Velocity of Flow (Ve)	Ft./Sec.	5.7	5.2	4.6	6.2
Slope of Exit Channel	Ft./Ft.	0.034	0.036	0.038	0.031
Maximum Water Surface Elevation	Ft.	730.41	726.07	673.33	715.3
Freeboard					
Rainfall Volume (FH)(areal)	In.	16.5	16.5	16.5	16.5
Runoff Volume (FH)	In.	13.85	13.85	13.97	13.69
Velocity of Flow (Ve)	Ft./Sec.	10.9	10.6	8.8	11.8
Maximum Water Surface Elevation	Ft.	734.05	729.44	675.64	719.7
Capacity Equivalents					
Sediment Volume	In.	0.85	1.13	1.31	1.01
Retarding Volume	In.	5.22	5.34	5.20	4.85

1/ 100-year sediment submerged

TABLE 3 - STRUCTURE DATA
FLOODWATER RETARDING STRUCTURES
Cypress Creek Watershed, Alabama & Tennessee

ITEM	UNIT	FRS STRUCTURE NO. 10	11	12	13
Class of Structure		b	a	b	b
Drainage Area	Sq. Mi.	8.92	5.75	2.60	7.20
Controlled	Sq. Mi.	---	---	---	---
Curve No. (1-day (AMC II½)		83	80	79	83
Tc	Hrs.	3.2	3.65	1.93	2.98
Elevation Top of Dam	Ft.	768.6	678.8	655.1	620.9
Elevation Crest Emergency Spillway	Ft.	762.3	674.2	651.0	616.2
Elevation Crest High Stage Inlet	Ft.	754.6	666.6	646.1	---
Elevation Crest Low Stage Inlet	Ft.	736.1	649.0	632.8	600.4
Maximum Height of Dam	Ft.	43	41	36.5	37
Volume of Fill	Cu. Yds.	300862	219713	115300	147724
Total Capacity	Ac. Ft.	3167	1858	876	2685
Sediment Submerged 1st 50 years	Ac. Ft.	164	102	77	256
Sediment Submerged 2nd 50 years	Ac. Ft.	163	101	76	256
Sediment Aerated	Ac. Ft.	56	35	26	88
Retarding	Ac. Ft.	2784	1620	697	2085
Between High and Low Stage	Ac. Ft.	1427	834	365	---
Surface Area					
Sediment Pool	Acres	40	24	17	60
Retarding Pool	Acres	204	115	57	243
Principal Spillway					
Rainfall Volume (areal)(1-day)	In.	6.9	6.9	6.9	6.9
Rainfall Volume (areal)(10-day)	In.	12.6	12.6	12.6	12.6
Runoff Volume (10-day)	In.	8.46	7.85	7.70	8.46
Capacity of Low Stage (Max.)	cfs	148	96	42	154
Capacity of High Stage (Max.)	cfs	256	181	112	---
Frequency Operation-Emergency Spillway	% chance	2	2	2	2
Size of Conduit	Dia. (in.)	42	36	30	36
Emergency Spillway					
Rainfall Volume (ESH)(areal)	In.	8.3	8.3	8.3	8.3
Runoff Volume (ESH)	In.	6.26	5.91	5.78	6.26
Type		Veg.	Veg.	Veg.	Veg.
Bottom Width	Ft.	250	300	200	300
Velocity of Flow (Ve)	Ft./Sec.	5.7	4.9	4.9	4.5
Slope of Exit Channel	Ft./Ft.	0.032	0.037	0.037	0.040
Maximum Water Surface Elevation	Ft.	764.04	675.50	652.26	617.33
Freeboard					
Rainfall Volume (FH)(areal)	In.	16.5	16.5	16.5	16.5
Runoff Volume (FH)	In.	14.27	13.85	13.69	14.27
Velocity of Flow (Ve)	Ft./Sec.	12.3	10.4	9.7	10.5
Maximum Water Surface Elevation	Ft.	768.59	678.81	655.05	620.9
Capacity Equivalents					
Sediment Volume	In.	0.80	0.77	1.29	1.56
Retarding Volume	In.	5.85	5.28	5.03	5.43

TABLE 3 - STRUCTURE DATA
FLOODWATER RETARDING STRUCTURES
Cypress Creek Watershed, Alabama & Tennessee

ITEM	UNIT	FRS STRUCTURE NO. 15	16	17	18
Class of Structure		a	a	a	b
Drainage Area	Sq. Mi.	4.36	2.65	1.43	6.61
Controlled	Sq. Mi.	---	---	---	---
Curve No. (1-day (AMC II½)		82	84	81	77 1/
Tc	Hrs.	2.64	1.66	1.29	3.23
Elevation Top of Dam	Ft.	702.9	708.3	671.3	816.9
Elevation Crest Emergency Spillway	Ft.	698.8	704.9	667.2	812.0
Elevation Crest High Stage Inlet	Ft.	693.6	700.8	663.3	---
Elevation Crest Low Stage Inlet	Ft.	680.2	688.7	653.7	790.4
Maximum Height of Dam	Ft.	35	34.3	26.6	44.0
Volume of Fill	Cu. Yds.	153596	119900	53767	202395
Total Capacity	Ac. Ft.	1565	1065	504	2400
Sediment Submerged 1st 50 years	Ac. Ft.	107	113	40	180
Sediment Submerged 2nd 50 years	Ac. Ft.	107	112	40	176
Sediment Aerated	Ac. Ft.	37	38	14	60
Retarding	Ac. Ft.	1314	802	410	1984
Between High and Low Stage	Ac. Ft.	675	437	214	---
Surface Area					
Sediment Pool	Acres	26	25	13	39
Retarding Pool	Acres	141	100	50	171
Principal Spillway					
Rainfall Volume (areal)(1-day)	In.	6.9	6.9	6.9	6.9
Rainfall Volume (areal)(10-day)	In.	12.6	12.6	12.6	12.6
Runoff Volume (10-day)	In.	8.46	8.75	8.01	8.46
Capacity of Low Stage (Max.)	cfs	69	51	23	176
Capacity of High Stage (Max.)	cfs	165	114	61	---
Frequency Operation-Emergency Spillway	% chance	2	2	2	3/
Size of Conduit	Dia. (in.)	36	30	24	36
Emergency Spillway					
Rainfall Volume (ESH)(areal)	In.	8.3	8.3	8.3	8.3
Runoff Volume (ESH)	In.	6.14	6.39	6.02	5.55
Type		Veg.	Veg.	Veg.	Veg.
Bottom Width	Ft.	300	300	100	300
Velocity of Flow (Ve)	Ft./Sec.	4.7	4.3	4.8	---2/
Slope of Exit Channel	Ft./Ft.	0.039	0.040	0.037	0.036
Maximum Water Surface Elevation	Ft.	700.01	706.01	668.49	811.4
Freeboard					
Rainfall Volume (FH)(areal)	In.	16.5	16.5	16.5	18.0
Runoff Volume (FH)	In.	14.12	14.12	13.97	14.85
Velocity of Flow (Ve)	Ft./Sec.	9.7	8.7	9.4	10.74
Maximum Water Surface Elevation	Ft.	702.86	708.33	671.25	816.9
Capacity Equivalents					
Sediment Volume	In.	1.08	1.86	1.23	1.18
Retarding Volume	In.	5.65	5.68	5.37	5.63

1/ Based on AMC II
2/ No emergency spillway flow
3/ Frequency of Operation - Less than once in 50 years

TABLE 3 - STRUCTURE DATA
FLOODWATER RETARDING STRUCTURES
Cypress Creek Watershed, Alabama & Tennessee

ITEM	UNIT	FRS STRUCTURE NO. 19	20	21	TOTAL
Class of Structure		b	b	b	
Drainage Area	Sq. Mi.	5.69	19.03	4.65	93.05
Controlled	Sq. Mi.	---	12.30	---	
Curve No. (1-day (AMC II½)		75 1/	75. 1/	79	
Tc	Hrs.	3.12	7.17	2.88	
Elevation Top of Dam	Ft.	697.2	604.8	598.4	
Elevation Crest Emergency Spillway	Ft.	693.0	601.0	592.3	
Elevation Crest High Stage Inlet	Ft.	---	586.5	---	
Elevation Crest Low Stage Inlet	Ft.	670.3	566.6	570.7	
Maximum Height of Dam	Ft.	42	61	49	
Volume of Fill	Cu. Yds.	180560	263640	148338	3048299
Total Capacity	Ac. Ft.	2200	11400	1574	37316
Sediment Submerged 1st 50 years	Ac. Ft.	136	477	221	2472
Sediment Submerged 2nd 50 years	Ac. Ft.	136	467	220	2449
Sediment Aerated	Ac. Ft.	46	162	75	841
Retarding	Ac. Ft.	1882	10294	1058	31554
Between High and Low Stage	Ac. Ft.	---	2943	---	9555
Surface Area					
Sediment Pool	Acres	30	67	31	521
Retarding Pool	Acres	164	710	100	2646
Principal Spillway					
Rainfall Volume (areal)(1-day)	In.	6.9	6.9	6.9	
Rainfall Volume (areal)(10-day)	In.	12.6	12.6	12.6	
Runoff Volume (10-day)	In.	6.79	6.79	7.70	
Capacity of Low Stage (Max.)	cfs	116	634	120	
Capacity of High Stage (Max.)	cfs	---	2120	---	
Frequency Operation-Emergency Spillway	% chance	4/	1	2	
Size of Conduit	Dia. (in.)	30	60 3/	30	
Emergency Spillway					
Rainfall Volume (ESH)(areal)	In.	8.3	8.3	8.3	
Runoff Volume (ESH)	In.	5.31	5.22	5.78	
Type		Veg.	Veg.	Veg.	
Bottom Width	Ft.	350	800	150	
Velocity of Flow (Ve)	Ft./Sec.	---2/	--- 2/	6.2	
Slope of Exit Channel	Ft./Ft.	.036	.030	.032	
Maximum Water Surface Elevation	Ft.	691.0	590.3	594.13	
Freeboard					
Rainfall Volume (FH)(areal)	In.	18.0	18.0	16.5	
Runoff Volume (FH)	In.	14.53	14.53	13.69	
Velocity of Flow (Ve)	Ft./Sec.	9.5	7.91	12.1	
Maximum Water Surface Elevation	Ft.	697.2	604.8	598.4	
Capacity Equivalents					
Sediment Volume	In.	1.05	1.09	2.06	
Retarding Volume	In.	6.20	10.15	4.27	

1/ Based on AMC II
2/ No emergency spillway flow
3/ 2-5'x6' monolithic box culverts for high stage riser
4/ Frequency of Operation - Less than once in 50 years

TABLE 3A - STRUCTURE DATA
CHANNELS
Cypress Creek Watershed
Alabama & Tennessee

Channel Designation	Reach Station Ft.	Reach Station Ft.	Drainage Area Sq. Mi. 1/	Capacity Req'd (cfs)	Capacity Design (cfs)	Hydraulic Gradient (ft./ft.)	Channel Dimensions Bottom (ft.)	Depth (ft.)	Side 2/ Slopes	"n" Value Aged	"n" Value As Built	Velocities Aged	Velocities As 2/ Built	Excavation (cu. yds.)	Planned Type of Work 3/	Before Project Type of Channel 4/	Before Project Flow 5/ Conditions	Material Classification Bank 6/	Material Classification Bed	Wetted Perimeter (ft.)	Minimum Cross-Sectional Area (ft.^{2})
Cypress Creek Main	410+00	437+00	11.10	185	300	0.0042		3.5	F	0.045	0.040	3.70	4.16	---	BLR	N	Pr	GW	GW	28	70
	437+00	476+00	12.20	340	425	0.0038		4.2	F	0.045	0.040	3.50	3.92	---	BLR	N	Pr	GW	GW	38	100
	537+00	560+00	14.13	515	729	0.0038		4.0	F	0.045	0.040	4.68	5.24	---	BLR	N	Pr	GW	GW	60	245
	560+00	642+00	16.64	515	680	0.0033		4.0	F	0.045	0.040	4.38	4.90	---	BLR	N	Pr	GW	GW	45	160
	642+00	652+00	19.70	515	680	0.0032		4.0	F	0.045	0.040	4.38	4.90	---	BLR	N	Pr	GW	GW	45	160
	691+00	828+00	25.32	550	583	0.0036		4.0	F	0.045	0.040	4.05	4.53	---	BLR	N	Pr	GP	GW	45	160
	828+00	919+00	45.21	1100	1080	0.0023	40	5.8	F	0.040	0.038	4.07	4.28	---	C&S	N	Pr	GP	GW	65	270
Dulin Branch	418+00	437+00	0.53	60	70	0.0060		2.5	F	0.045	0.040	3.80	4.26	---	BLR	M (1954)	Pr	GW-GM	GW	22	60
North Fork	541+00	557+00	0.29	110	180	0.0040	8	3.0	3:1	0.040	0.025	3.59	5.74	3560	NCE	N	Pr	GW	GW	--	--
Threet Creek 7/	623+00	641+00	3.44	135	163	0.0032	8	3.0	3:1	0.040	0.025	3.21	5.13	4400	NCE	N	Pr	SC-SM	GW	--	--
Middle Cypress Creek	447+00	563+00	5.50	275	309	0.0036			F	0.045	0.040	3.94	4.41	---	C&S	N	Pr	CM	GW	30	80
	682+00	738+00	10.61	350	371	0.0030			F	0.040	0.038	3.75	3.95	---	C&S	N	Pr	GW	GW	38	100
	738+00	829+00	14.22	550	650	0.0025			F	0.040	0.038	4.56	4.79	---	C&S	N	Pr	GW	GW	45	160
Little Cypress Creek	992+00	1032+00	7.86	790	785	0.0012			F	0.045	0.040	3.29	3.70	---	C&S	N	Pr	GW-GM	GW	59	240

1/ Drainage area shown is uncontrolled drainage area or that not controlled by floodwater retarding structures.
2/ F indicates reaches in which channel work performed will be done so as to conform to the existing channel banks.
3/ BLR (Bedload Removal), C&S (Clearing and Shaping), NCE (New Channel Excavation).
4/ N (An Unmodified, Well-Defined Natural Channel or Stream), M ( ) - Man-made Ditch or Previously Modified Channel with Approximate Date of Construction in Parentheses.
5/ Pr (Perennial - Flows at All Times Except During Extreme Drought).
6/ GW (Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines), GP (Poorly Graded Gravels or Gravel-Sand Mixtures, Little or No Fines), SP (Poorly Graded Sands or Gravelly Sands, Little or No Fines), GM (Silty Gravels, Gravel-Sand Mixture), GW-GM (Well Graded Gravel with 7-12 Percent Fines), SC-SM (Either a Clayey Sand (SC) or a Silty Sand (SM).
7/ Drop structure located at Station 637+00, see table 3B.

TABLE 3B - STRUCTURE DATA

GRADE STABILIZATION STRUCTURE

Cypress Creek Watershed, Alabama and Tennessee

Station	Drainage Area	Design Cap.	Assoc. Frequency and Duration of Storm	Drop	Concrete	Type of Structure
	(Sq.Mi.)	(cfs)		(ft.)	(cu. yds.)	
Sta. 637+00 Threet Cr.	3.44[1/]	160	0.6 yr. 24 hr.	3.5	38.0	Reinforced Concrete Drop Spillway

1/ Uncontrolled drainage area. Floodwater retarding structure 9 controls runoff from 5.98 square miles.

January 1976

Streambanks throughout the watershed are composed of silt and coarse gravel. In the areas of channel work, the upper one-third of the bank is primarily silt and the lower two-thirds is primarily silty gravel. Streambeds throughout the watershed are composed of coarse gravel. Cypress Creek near Cloverdale, the lower reaches of Middle Cypress, and Dulin Branch are either partially or completely clogged with gravel. There are occasional rock ledges and shoals in all the channels.

Bedload removal will be performed in portions of evaluation reaches II, III, V, and VII on about 6.3 miles of Cypress Creek and Dulin Branch (see appendix C).

Bedload is the loose sand, gravel, and cobbles that have accumulated and are being transported within the channel. This material has clogged the channel and materially reduced the carrying capacity of the stream.

Bedload will be removed with a minimum disturbance to the streambank and trees (particularly the Bald Cypress) along the existing channel (see appendix D). Work will be accomplished in segments about ¼ mile long separated by undisturbed reaches of about the same length. About three access points will be needed in each work segment. Each access point will be cleared, as needed, but not more than 200 feet of bank along one side of the channel.

The first segments excavated will be those furthest downstream where the greatest bedload accumulation occurs (Phase 1). The remaining segments will be excavated within 1 to 2 years (Phase 2). During the second construction phase, repair of unstable areas and excavation of the bedload that has accumulated and is causing problems in the first excavated segments will be accomplished.

Construction equipment will enter and exit the channel only at the designated access points. Bedload material will be loaded directly into this equipment and hauled from the channel at access points or pushed to the access points where it will be dipped out with a dragline. Existing roads and open areas will be used where possible to minimize clearing. Access roads to the work segments will be constructed as necessary.

Where more than one channel exists in a given reach, the one requiring the least environmental disturbance will be selected for improvement. Clearing of trees will be held to a minimum. Existing openings, sloughs, and other depressions will be used for spoil disposal. The sterile, coarse, cobbly gravelly spoil material will be placed in excavated trenches and covered with topsoil. The disturbed areas will be shaped and vegetated (see appendix D).

Clearing and shaping will be performed in portions of evaluation reaches VIII, IX, XI, XIII, and XXV on about 7.5 miles of Middle Cypress Creek, Cypress Creek and Little Cypress Creek (see appendix C). Segments which do not have sufficient capacity will be cleared and shaped within banks and areas disturbed during construction will be shaped and vegetated or otherwise protected to reduce downstream sediment and assure stability.

There are segments, totaling approximately 2 miles, within the 7.5 miles of streams planned for clearing and shaping which have adequate capacity. These segments will not be disturbed except for stabilizing channel banks with riprap as needed.

Clearing and shaping will follow the existing channel alignment and will be done by using chain saws, wenches, front-end loaders, scrapers, backhoes, and other conventional equipment. The exact location and work to be done will be determined during final design. Sand and other mineral spoil removed will be disposed of by burying and revegetating the disturbed areas (see appendix D). Woody material will be burned in accordance with federal, state and local laws and regulations.

New channel excavation will be performed in portions of evaluation reaches IV and VI on about 0.6 miles of Threet Creek and North Fork Creek (see appendix C). On North Fork Creek work begins about 800 feet downstream from the right-of-way of Natchez Trace Parkway, (station 541+00) and proceeds about 1,000 feet downstream to the point where North Fork Creek turns right and runs parallel to Cypress Creek (station 551+00). At this point new channel excavation will be done for about 600 feet to intersect Cypress Creek at a point about one-third mile above the present confluence of North Fork Creek and Cypress Creek (station 557+00).

The remaining excavation will be done on Threet Creek beginning about one-third mile downstream from Natchez Trace Parkway at the point where Threet Creek turns south and parallels Cypress Creek (station 623+00). At this point, new channel excavation will join and extend to Cypress Creek at a point about three-fourths of a mile above the present confluence of Threet Creek with Cypress Creek (station 641+00). This work amounts to 1,800 feet of new channel excavation. To provide a stable channel in this reach of work a reinforced concrete drop spillway will be installed near the confluence of Threet Creek with Cypress Creek (see appendix M).

The new channel excavation will realign portions of these creeks. After construction, they will flow into Cypress Creek further upstream than at present. The realignment eliminates about 2 miles of channel work that would have been needed if the existing channel had been followed.

Channels will be excavated with draglines, scrapers, or other conventional earth-moving equipment. Spoil from the new channels will be spread and shaped to permit safe mowing and other maintenance (see appendix D). Surface drainage will be by open ditches, spoil openings, rock inlets, and pipes through spoil banks. Pipe will be used where scour is a problem and where needed for maintenance access roads.

Installation of the channel will require 406 acres of land. This area consists of 242 acres of forest land and 78 acres of pasture and row crops and 86 acres of existing channel.

Land required for doing the channel work includes 186 acres for bedload removal; 210 acres for clearing and shaping; and 10 acres for new channel excavation. Channel work will not require relocation of existing improvements.

The minimum land rights required will be those necessary to construct, operate, maintain, and inspect the channel work. Project sponsors will operate and maintain the channel work in accordance with a specific operation and maintenance agreement. The agreement will set forth the inspections to be made and the maintenance to be performed.

The environment will be protected from soil erosion and water and air pollution during construction in the same manner as described for the floodwater retarding structures in the previous subsection.

The proposed channel work has a potential for destruction of some habitat of the slackwater darter which is a candidate for protection under the Endangered Species Act of 1973. The final plans and specifications for the channel work will include measures to preserve the habitat of the darter or mitigate the loss of habitat. Plan elements will be based on a detailed study of the habitat requirements of the slackwater darter and will be coordinated with the U. S. Department of the Interior.

Should any archaeological or historical sites be discovered during and as a result of the installation of structural measures, construction will be stopped. The Secretary of the Interior (National Park Service), the Curator of Anthropology, and the Historical Preservation Officer will be given an opportunity to evaluate the sites and make recommendations for salvage or mitigation before construction continues. Also, the Advisory Council on Historic Preservation will be afforded an opportunity to comment in accordance with the "Procedures for the Protection of Historic and Cultural Properties." Since this is a federally assisted local project, there will be no change in the existing responsibilities of any Federal agency under Executive Order 11593 with respect to archaeological and historical resources.

Land treatment measures will be maintained by the landowners and operators of farms on which the measures are installed under agreements with the Wayne County Soil Conservation District and the Lauderdale County Soil and Water Conservation District. Representatives of these Districts' will encourage landowners to maintain land treatment measures.

The Alabama Forestry Commission and the Tennessee Division of Forestry, in cooperation with the U. S. Forest Service, will furnish technical assistance necessary for operating and maintaining forest land treatment measures. They will do this through the Cooperative Forest Management Program. The Alabama Forestry Commission and the Tennessee Division of Forestry will continue fire protection under the Cooperative Forest Fire Control Program.

The Three Cypress Creek Watershed District will be responsible for the operation and maintenance of those structural measures in Tennessee. Funds for this purpose will be provided by the Watershed District by an assessment against the benefitted land. The estimated average annual cost of operation and maintenance in Tennessee is $4,900.

The Lauderdale County Commission will be responsible for the operation and maintenance of those structural measures in Alabama. Funds for this purpose will be provided from the counties general tax revenue. The estimated average annual cost of operation and maintenance in Alabama is $14,600. The estimated average annual costs for operation and maintenance in the watershed is $19,500.

The Service and the sponsors will make a joint inspection annually or after unusually severe floods, or in the event of other unusual conditions that may adversely affect the works of improvement, for three years following installation of each structure. Inspection after the third year will be made annually by the sponsors. The Service will participate in annual inspections as often as it elects to do so after the third year. Inspection items are those items which may need maintenance. Items of inspection and maintenance on the structures will include, but will not be limited to, condition of principal spillways, earth fills, emergency spillways, vegetative cover, fences, gates, and vegetative growth in reservoirs. Items of inspection and maintenance on the channel work will include, but will not be limited to, sand bars, undesirable vegetation, logs, stumps, and other debris in the channels.

It is estimated that a 3-year establishment period will be needed for the channels to reach a stable "aged" condition. It is expected that

remedial work including spot revegetation, sand bar and debris removal, and riprap for protection of eroding areas of channel banks will be needed during the establishment period. This work will be done by the Service using PL-566 funds.

Immediately following completion of the structures by the contractor, the sponsors will be responsible for and promptly perform, or have performed, without cost to the Service, all maintenance of the structural measures as determined to be needed by either the sponsors or the Service. The sponsors will be responsible for maintenance of vegetation associated with structural measures after the initial vegetation work is adequately completed, as determined by the Service, but no later than three years following completion of each structural measure. Maintenance of the floodwater retarding structures will consist of items such as controlling undesirable vegetation by mowing, hand cutting, or using herbicides; painting metal parts; and repairing eroded areas. Maintenance of the channel work will involve mowing, fertilizing, and reseeding of vegetated areas; removing undesirable debris from the channel flow area and; following the initial 3-year vegetative establishment period, repair any damage or change in the vegetation. The mowing operations for the most part will be done with a farm-type tractor and shredder. Use of herbicides will be in accordance with state regulations.

An operation and maintenance agreement will be executed by the parties hereto prior to the signing of the initial project agreement and the issuance of invitations to bid on construction of the structural measures. The agreement will set forth specific details on procedure in line with recognized assignments of responsibility. The operation and maintenance agreement will include specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance.

Project Costs

The following is an explanation of project cost:

	PL-566	OTHER	TOTAL
Total Land Treatment	257,700	1,131,000	1,388,700
Total Structural Measures	7,502,600	697,000	199,600
TOTAL Project	7,760,300	1,828,000	9,588,300
TOTAL Construction	6,018,800	XXX	6,018,800

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WATERSHED RESOURCES-ENVIRONMENTAL SETTING

Physical Resources

General

Cypress Creek Watershed comprises an area of 135,360 acres, or 211.5 square miles, in Lauderdale County in northwest Alabama and Wayne County, south-central Tennessee. Approximately 84,990 acres are in Alabama and 50,370 acres are in Tennessee.

The watershed is located about 125 miles northwest of Birmingham, 125 miles southwest of Nashville, 150 miles east of Memphis, and 65 miles west of Huntsville. The watershed lies within the Tennessee River Basin. Florence, Alabama, with a population of 34,000 per 1970 census, is located partially within the watershed. Numerous small towns and communities in the watershed include North Florence, Cloverdale, McGee Town, Petersville, Mars Hill, Lovelace Crossroads, Central Heights, Sullivan Crossroads, Jacksonburg, and Johnson Crossroads, in Alabama, and Cypress Inn and Fairview, in Tennessee. The Quad-City area of Florence, Sheffield, Tuscumbia, and Muscle Shoals is located either in or near the lower part of the watershed. This area had a population of 85,000 per 1970 census.

In 1970, the urban and rural populations in the watershed were about 35,000 and 3,000 respectively per 1970 census.

The watershed lies in the Tennessee River Water Resource Region and Tennessee-Elk and Lower Tennessee subarea. 16/ Cypress Creek originates in Wayne County, Tennessee, near Collinwood and flows into the Tennessee River near Florence in Lauderdale County, Alabama, about 4.4 miles below Wilson Dam.

Cypress Creek Watershed is influenced economically and socially by the Quad-City area. The water resource region and subarea are not influenced as much by urban areas as is Cypress Creek Watershed. Both the watershed and the water resource region contain good agricultural lands, but most of the region has a more rural character than does Cypress Creek.

The principal problems in the watershed are floodwater damages to the flood plain area, sheet erosion on upland areas, erosion damage to the flood plain, and critically eroding areas. Floodwater damage occurs on 10,321 acres of which 7,851 acres are in cropland or pastureland. Erosion of most of the cropland area in the watershed exceeds an acceptable rate for sustaining high productivity. There are about 60 acres of

critically eroding areas along roadbanks, gullies, the borders of agricultural land, borrow pits, and streambanks. These areas are widely distributed but are mostly found in the northern and northwestern portions of the watershed.

Soils

Soils of the upland are derived from limestones, cherty limestones, sands, clays, and gravel. Soils are described by general soil associations (see appendix E). These associations are broad areas of similar landscape that are characterized by one or more soil series names. Soils within an association generally occur in a repeating pattern with certain soils occupying specific landscape positions.

The northern portions of the watershed are mostly within the Dickson-Bodine-Saffell association. Slopes on most of these soils are commonly 2 to 10 percent, but some have slopes up to 35 percent. Most of these soils have fair to good suitability for cropping and are well suited to pasture and forest land. Most of these soils have a moderate hazard in constructing local roads and streets. The limitation for septic tanks is moderate to severe. The limitation for light industry and dwellings is moderate for most soils in this formation.

Soils in the central portion of the watershed are mostly in the Dickson association. The soils of this portion of the upland have the highest potential for agriculture of any soil association in upland areas in the watershed because they have generally more gentle surfaces with less coarse fragments. Slopes commonly range from 1 to 15 percent. Most of the soils in this association have a fair to good suitability for cropland, and they are well suited to pasture and forest land. The hazards encountered in constructing local roads and streets are moderate for most of these soils. The limitations for septic tanks are moderate to severe; and for light industry, it is moderate to severe. Limitations for dwellings are moderate for most of these soils.

Soils in the lower end of the watershed, along the sides of stream valleys, and at lower elevations are mostly within the Bodine-Dewey-Dickson-Fullerton association. Bodine, Dewey, Dickson, and Fullerton are the major soils of the association. They occupy about 90 percent of the area. Bodine, Dewey, and Fullerton are deep, well drained, slightly cherty to very cherty soils. They are on the more sloping and steeper upland areas of the association. Dickson soils are deep, moderately well drained soils with a fragipan. They are on the less sloping upland areas. Minor soils that make up the remainder of the association are Smithdale and Decatur soils on uplands. Slopes range from 2 to 35 percent. Most of these soils are fairly well suited for cropland and

well suited for pasture and forest land. Hazards encountered in constructing roads and streets are moderate to severe. Most of these soils have a moderate limitation for septic tanks, a severe limitation for light industry, and a moderate limitation for dwellings. Most limitations and hazard ratings are assigned to these soils because of their steep slopes. Continuous cropping of these soils on steep slopes causes severe erosion and eventually destroys the soil resource.

A portion of the southeastern part of the watershed is in the Dewey-Decatur-Dickson soil association. The major soils--those in the Dewey, Decatur, and Dickson series--make up about 85 percent of the association. Dewey and Decatur are deep well drained soils on nearly level to sloping uplands. The Dickson soils are deep and moderately well drained with fragipans. They occur on nearly level to gently sloping uplands. The minor soils--those in the Fullerton and Bodine series, and the Grasmere soils in upland depressions--make up the remainder of the association. Slopes of the major soils range from 2 to 10 percent. These soils are well suited to commonly grown row crops and forages if erosion control practices are followed. Hazards encountered in constructing local roads and streets are moderate for most of these soils. The limitation for septic tanks is slight or moderate for the Dewey and Decatur soils and severe for the Dickson soils. Most of these soils have a moderate rating for dwellings and light industry.

The flood plain soils are mostly in the Lobelville-Lee-Etowah-Pruitton association and are related to the upland soils. They are formed in alluvial sedimentary deposits derived from erosion of the uplands. Most are silty soils with gravelly subsoils and sub-strata being common. With good management, these soils will produce high crop and pasture yields. They occupy smooth, level, and generally wide areas with fair natural drainage and little ponding. All are subject to flooding which is a severe hazard to agricultural and urban use.

Along the Tennessee River in the extreme southern end of the watershed, the soils are in the Choccolocco-Chennely-Stasser association. The soils in the association name make up 95 percent of this association. They are deep, well drained to somewhat poorly drained soils on stream terraces and flood plains. The minor soil making up the remainder of the association is an Ennis soil which occupies stream terrace positions. These soils have the potential to produce high yields of row crops and forages. Some of the soils have a wetness hazard. All are subject to flooding which is a severe hazard for all urban uses and a varying hazard to agricultural uses, depending on the individual soil.

Topography

Topography varies from nearly level in the flood plain to moderately rolling and steep in the uplands. Elevations above mean sea level range

from 415 feet at the mouth of Cypress Creek to 1,025 feet along the northern boundary of the watershed near the intersection of Natchez Trace Parkway and Tennessee Highway No. 13 (see appendix C).

The upland is somewhat rolling with steep breaks near the stream valleys. Occasionally, rocky cliffs line the stream along the lower 10 miles of Cypress Creek and the middle one-third of Little Cypress Creek. The entire upland becomes rougher and more rolling toward the northwest in the gravelly "high coastal plains" country in Tennessee.

Geology 1/ 2/

The watershed lies within two physiographic sections: the Fall Line Hills of the East Gulf Coastal Plains Physiographic Province and the Highland Rim Section of the Interior Low Plateaus Physiographic Province. The transition from one section to the other is not distinct but takes place gradually as the characteristics of one area begin to fade and the other predominates. Technically, most of Wayne County, Tennessee, is in the Highland Rim but has a capping of Coastal Plains material on the ridges and high points. Conversely, the deeper valleys of the Coastal Plains in the western part of the watershed are cut down through the thin wedge of Coastal Plains material to the underlying Paleozoic rocks below.

The geologic formations in the watershed are marine and non-marine Paleozoic and Mesozoic sedimentary rocks. The outcropping strata are of Mississippian and Upper Cretaceous Ages (see appendix I).

The Cretaceous formations crop out in the northern and western portion of the watershed and extend to the northwest. Their outcrop occurs in the Fall Line Hills of the Coastal Plains Physiographic Province. The marine and non-marine sedimentary rocks include beds of sand, gravel, and clay. The strata dip westward and southwestward with a dip, of about 30 to 45 feet per mile. Deposits are assigned to the Cretaceous System, Upper Cretaceous Series, and are in ascending order: the Tuscaloosa Group, which has not been differentiated in the watershed, and the Eutaw Formation.

The Tuscaloosa consists mainly of gravel but contains vari-colored lenticular beds of clay and sand. The gravel is composed almost entirely of rounded chert pebbles. These rounded pebbles distinguish the Tuscaloosa Group from the underlying weathered Fort Payne or Tuscumbia, in which the chert is angular. "Hardpan" layers of sand, bound together by ferruginous cement, are common throughout the deposits. Except for the "hardpan", which usually extends only a few feet laterally, the gravel shows little stratification, the sands and clays are

partly stratified; cross-bedding is fairly common in the sands. The Tuscaloosa rests unconformably on weathered bedrock of Mississippian Age. The formation thickens westward and passes beneath the Eutaw Formation along the western border of the watershed in Wayne County, Tennessee. The Tuscaloosa is apparently non-marine in surface exposures, consisting of land derived sediments (sand, clays, and gravel) deposited in a delta-like environment.

The Eutaw consists mostly of cross-laminated, fine to medium-grained, well sorted micaceous sand interbedded with micaceous glauconitic clay. The sediments of the Eutaw are typical of a shallow marine environment.

The Mississippian formations cropping out in the watershed are within the Highland Rim Section of the Interior Low Plateaus Physiographic Province. The formations in ascending order are Fort Payne Chert and Tuscumbia Limestone (The Tuscumbia is equivalent to the Warsaw and St. Louis of Tennessee reports but is undifferentiated in the vicinity of the watershed).

The Fort Payne Chert consists mostly of thin to medium bedded hard siliceous limestone. It contains large quantities of chert (opaline silica or chalcedony) as nodules, lenses, and bands. The chert is disseminated throughout but is prevalent near the base of the formation. The formation weathers to a solid, brittle, blocky chert, and siliceous shale.

The Tuscumbia Limestone consists of thin to medium bedded, finely crystalline, hard limestone with nodules and bands of chert. In most of the area, the formation is completely weathered to clay and silt; and surface exposures are rare.

The two Mississippian formations are almost completely covered by a thick mantle of unconsolidated rock debris known as regolith. This includes all unconsolidated deposits except the Cretaceous formations and consists of weathered rock, alluvial, terrace, and slope wash deposits. The regolith varies considerably in thickness from less than 50 feet in stream valleys to more than 100 feet in the uplands. This is an important source of ground water to wells and streams.

The watershed is on the southwest flank of the Nashville dome. Regional dip of the rocks is toward the southwest at 30 to 45 feet per mile. Subsurface mapping of the top of the Chattanooga Shale indicates several small anticlines, synclines, basins, and other structures in the vicinity of the watershed. A small elongated basin extends nearly due east beneath Cox Creek Valley north of Florence in the watershed.

Climate:

Rainfall in Cypress Creek Watershed averages 49 inches per year with October being the driest month and March being the wettest. Thunderstorms and intense showers of short duration are common during the spring. Dry conditions prevail from mid-summer to late fall, but severe droughts are uncommon. Average monthly rainfall in inches is as follows: 17/

Jan.	5.2	May	3.4	Sept.	3.1
Feb.	5.2	June	3.4	Oct.	2.7
Mar.	5.6	July	4.3	Nov.	3.6
Apr.	4.0	Aug.	3.3	Dec.	4.9

Winters are relatively mild and summers warm. The average annual temperature is 61 degrees Fahrenheit with the average monthly temperature varying from 45 degrees Fahrenheit in February to 81 degrees Fahrenheit in July. These temperature extremes range from a high of about 95 to 100 degrees Fahrenheit in June and July to a low of 0 to -5 Fahrenheit degrees in January and February.

The length of the growing season is about 200 days with the last killing frost occurring in April and the first occurring in October.

Mineral and Ground Water Resources

Sand and gravel are plentiful in the watershed. Gravel has been mined from open roadside pits in the northern portion of the watershed (Wayne County, Tennessee) and from flood plain alluvium and stream deposits in isolated places throughout the watershed. A mixture of gravel and clay is mined for road fill in the central portion of the watershed; these road material quarries are locally called "chert pits". Sand and gravel are dredged from the Tennessee River below the mouth of Cypress Creek with the watershed a source of some of this material. Because of the wide distribution of these resources, mining is more closely related to point of need and location of an operator's holdings rather than to the location of isolated mineral deposits.

Recent interest in finding new sources of fuel has reidentified the Chattanooga Shale as a source of radioactive material. The Chattanooga Shale underlies nearly all the watershed, but it lies at depths of 100 to 250 feet or more. Mining of this radioactive material is a remote possibility.

Limestone has not been extensively mined. The limestone formations in the watershed are highly siliceous and are not useful for lime because of their high silica content. These limestones are useful for crushed

rock. But they are deeply buried with their own weathering products and cannot compete with quarries where the overburden is shallow. Limestone mining has low potential for development in the watershed.

Ground water in the watershed exists mostly as non-artesian or unconfined water. Some artesian conditions exist in the Tuscumbia Limestone, Fort Payne Chert, and deeper formations; but pressures are generally not sufficient to produce flowing wells (see appendix H).

Most ground water discharge in the watershed is from springs. The larger springs flow from fractures in the Fort Payne Chert and Tuscumbia Limestone, but many minor springs flow from sands and gravel beds in the Tuscaloosa Group and from the regolith.

Where the Tuscaloosa Group is continuous over large areas, it furnishes enough water to wells for domestic and livestock needs. The Tuscaloosa is an important aquifer to the west and south of the watershed. The saturated zone within the watershed is too thin to produce large volumes of water, but the watershed is part of an important recharge area. Water is of good quality with an average hardness of 25 ppm (parts per million).

Most wells in the southern two-thirds of the watershed obtain water from the regolith on the Fort Payne Chert and Tuscumbia Limestone. The regolith yields water to either dug or drilled wells nearly everywhere it exists, but large yields are uncommon. Springs are common but small. Water is of satisfactory quality, but many of the wells are subject to pollution. Occasionally, local concentrations of chlorides make water unsatisfactory for household use.

Land Use

Present land uses in the watershed are:

Land Uses	Present	
	Acres	Percent
Cropland	15,947	11.8
Pasture land	25,046	18.5
Forest land	84,992	62.8
Miscellaneous	9,375*	6.9
Total	135,360	100.0

* Roadsides, farmsteads, urban, wildlife, and idle land.

The present land uses in the flood plain are as follows:

Land Uses	Present	
	Acres	Percent
Cropland	3,261	31.6
Pasture land	4,590	44.5
Forest land	2,291	22.2
Idle	55	0.5
Miscellaneous	124	1.2
Total	10,321	100.0

Land uses around gullied areas of the watershed are mostly in pasture and forest land or along roadbanks.

Surface Water Resources

Cypress Creek Watershed contains three major streams, with numerous tributaries entering them. The three streams are Cypress Creek, Middle Cypress Creek, and Little Cypress Creek (see appendix C). Cypress Creek originates near Collinwood, Tennessee, and flows in a southerly direction through Wayne County, Tennessee, and Lauderdale County, Alabama, until it flows into the Tennessee River at Florence, Alabama. Cypress Creek is about 3 feet deep, 20 feet wide, and has a capacity of about 250 cfs (cubic feet per second) near Cypress Inn, Tennessee. It increases to 11 feet deep, 100 feet wide, and has a capacity of about 3,000 cfs immediately below its confluence with Little Cypress Creek. From its confluence with Little Cypress Creek, it continues southward about 10.3 miles and enters the Tennessee River about 4.4 miles below Wilson Dam.

Stream channels along Cypress Creek, from its junction with Lindsey Creek, upstream to the Alabama-Tennessee state line are partially to completely filled with gravel. Middle Cypress from the state line downstream to Cypress Creek is in a similar condition but to a lesser degree. In the more severe cases of complete filling, new channels are cut at random by water flow. In these areas it is evident the procedure has repeated itself many times. In some cases, the "cut" channel fills to such a level that water is diverted back into the old channel again.

Occasional rock ledges and shoals are in all the channels, with numerous rock shoals in the mid-portion of Little Cypress Creek and in the lower reaches of Cypress Creek. The shoals in Lower Cypress Creek restrict

boat traffic to the lower three miles of the creek. An old mill pond known as Sharp's Mill Dam is located on Little Cypress Creek (see reach XXIII on Project Map, appendix C). It consists of about 12 water-surface acres with a maximum depth of 4 feet.

Streams in the watershed are perennial with two notable exceptions on the west side of the watershed: Lindsey Creek and Burcham Creek (with its tributary, Bruton Branch) are intermittent about two-thirds of the way down their courses. Streams in the watershed are natural except Dulin Branch which was modified in 1954. Average baseflow is 1.8 cubic feet per second per square mile. 3/

The Alabama Water Improvement Commission has classified the streams in this watershed according to their present use (see page 53).

The Geological Survey of Alabama and the Environmental Protection Agency determined water quality at five places in the watershed. Their data are shown on the Table of Water Quality Data (see page 54).

Three water quality parameters--water temperature, pH, and D. O. (dissolved oxygen)--were determined at several places in the fall of 1973 by Dr. Paul Yokley, Jr., Professor of Biology, University of North Alabama, Florence, Alabama. 20/ According to these determinations, pH values are lowest in the headwater tributary streams (6.4) and increase progressively downstream (7.2) to the main parts of Cypress Creek. The difference in pH levels is attributed to greater amounts of exposed limestone in the downstream reaches and to the lack of exposed limestone in the upper tributaries, with the exception of Little Cypress Creek. Soft waters which result from the absence of dissolved calcium carbonates are partly responsible for the scarcity of bivalved mollusks in the upper tributary streams. Temperatures ranged from 12 degrees Centigrade in the cooler months to 22 degrees Centigrade in the warmer months. Water tested in Cypress Creek Watershed had a D.O. of ten which indicates a limited amount of organic pollution from sources such as feed lots, sewage disposal systems, and fertilizers.

The watershed contains approximately 5,230 acres of Type I wetland as defined in Wetlands of the United States, U. S. Department of the Interior, Fish and Wildlife Service, Circular C-39. Other small areas of wetland types may exist in the watershed.

Present and Projected Population

Wayne County, Tennessee had a 1950 population of 13,864 with 8,109 rural farm residents. In 1960 the total population had dropped to 11,908 and rural farm population had dropped to 3,984. The total

WATER USE CLASSIFICATIONS*
CYPRESS CREEK WATERSHED
Lauderdale County, Alabama, and Wayne County, Tennesse

Stream	From	To	Public Water Supply	Swimming	Fish and Wildlife	Fish and Wildlife as a Goal **
CYPRESS CREEK	TENNESSEE RIVER (Pickwick Lake)	City of Florence Water Treatment Plant			X	
CYPRESS CREEK	City of Florence Water Treatment Plant	Little Cypress Creek	X		X	
CYPRESS CYPRESS	LITTLE CREEK	Ala-Tenn State Line			X	
LITTLE CYPRESS CREEK	CYPRESS CREEK	Ala-Tenn State Line			X	

* From "Water Use Classifications for Interstate and Intrastate Waters of the State of Alabama" by the Alabama Water Improvement Commission as of September 17, 1973.

** Fish and Wildlife as a Goal pertains to all waters in the state which have not been classified.

WATER QUALITY DATA
CYPRESS CREEK WATERSHED
LAUDERDALE COUNTY, ALABAMA AND WAYNE COUNTY, TENNESSEE

Date of Collection	Discharge (CFS)	Silica (MG/L)	Iron (UG/L)	Calcium (MG/L)	Magnesium (MG/L)	Sodium (MG/L)	Potassium (MG/L)	Bicarbonate (MG/L)	Sulfate (MG/L)	Chloride (MG/L)	Flouride (MG/L)	Nitrate (MG/L)	Dissolved Solids (MG/L	Hardness MG/1	Calcium Hardness MG/L	Noncarbonate Hardness MG/L	Specific Conductance (micromho)	pH (SU)	Color (UNITS)	BIOCHEMICAL OXYGEN DEMAND	DISSOLVED OXYGEN	WATER TEMP. DEGREES F	TURBIDITY	NITRITE (MG/L)	AMMONIA (MG/L)	PHOS-D ORTHO (MG/L P)	PHOS-T P-WET (MG/L)	TOT KJEL (MG/L)
*	CYPRESS CREEK AT FLORENCE																											
5-5-65	225	5.9	0.06	13	0.6	1.6	0.5	42	2.2	1.7	0.1	0.2	A47	35	11	76	6.5	15										
*	CYPRESS CREEK NEAR CLOVERDALE																											
9-1-60		7.0	0.11	8.2	0.7	1.1	0.2	27	2.8	2.8	0.1	0.0	36	24	2	52	6.6	2			74							
*	MIDDLE CYPRESS CREEK NEAR CLOVERDALE																											
9-1-60						1.2	0.6	60	j2	9			i61	49	0	102	7.3	3										
*	LITTLE CYPRESS CREEK NEAR FLORENCE																											
9-1-60						0.8	0.4	62	j1	7			i61	51	0	102	7.7	3										
**	CYPRESS CREEK (BRIDGE ON WATERLOO ROAD)																											
3-3-73												.428											.003	.032	.024	.056	.64

* U.S. GEOLOGICAL SURVEY OF ALABAMA "A COMPILATION OF SURFACE WATER QUALITY DATA IN ALABAMA CIRCULAR 36"

** ENVIRONMENTAL PROTECTION AGENCY (indicated value represents the mean value determined over a period of measurement from 3/3/73 to 7/14/73)

A-Calculated
i-Sum of mineral constituents in ppm equals specific conductance times a factor
j-Parts per million SO_4 + Cl = equivalents per million bicarbonate times 41.7

population increased to 12,365 in 1970 but rural farm population decreased to 1,788. 18/ The total population is projected to be 17,000 by 1990 and 27,700 by 2020. 5/ The rural farm population is expected to decrease at a slower rate.

Lauderdale County, Alabama had a 1950 population of 54,197. By 1960 the population had increased to 61,622 with 9,473 rural farm residents. The total population increased to 68,111 in 1970 with rural farm population decreasing to 5,012. 18/ The total population is projected to be 78,800 by 1990 and 91,200 by 2020. 4/ The rural farm population is expected to decrease at a slower rate and may stabilize with increased demand for food and fiber.

The 1969 population of the Tennessee-Elk water resource subarea was 725,300. It is projected to be 982,100 in 1990 and 1,521,700 in 2020. Population of the Lower Tennessee water resource subarea was 296,100 in 1969. It is expected to be 392,500 in 1990 and 606,100 in 2020. 6/ Most of the watershed population is in the Tennessee-Elk water resource subarea.

Economic Resources

The economy generated within the watershed is based almost entirely on agriculture and associated agribusiness. Agriculture and assosciated agribusiness are expected to be of prime importance to the economy for the forseeable future due to the basic demand for food and fiber.

Nearly all of the land in the watershed is in private ownership. The U. S. Department of Interior, National Park Service, administers the Natchez Trace Parkway, of which about 17.5 miles crosses the western portion of the watershed. The Tennessee Valley Authority (TVA) owns about 575 acres of land in the lower reaches of the watershed.

There are approximately 1,145 farms in the watershed which average about 200 acres in size. Most of the farms are family type. Major farm enterprises are soybeans, cotton, corn, beef cattle, and dairying.

Average crop yields are as follows:

	Unit	Watershed Present Yield/Acre	Flood Plain Present Yield/Acre
Cotton	lbs.	602	590
Corn	bu.	64	60
Soybeans	bu.	26	23
Pasture	AUM*	6.3	5.9

* Animal Unit Month is the amount of grazing that it takes to satisfy the grazing needs of one mature cow for one month.

Agricultural land values range from $200 to $600 per acre, depending on soil capability and location. Urban land values range from a few thousand dollars for a city lot to many thousands of dollars for commercial property.

Transportation facilities serving Cypress Creek Watershed are excellent. The Tennessee River provides an economical means of shipping to many parts of the United States. Highway transportation is provided by Alabama Highways 17, 20, 157, and Tennessee Highway 13. In addition, numerous county roads provide excellent farm-to-market transportation. As stated earlier, 17.5 miles of Natchez Trace Parkway traverses the watershed. Both the Southern and the Louisville and Nashville Railroads furnish railway transportation.

Because of rapidly expanding industries in the Quad-City area, excellent markets are available for agricultural products and services.

Lauderdale County, Alabama, has a work force of 19,950 with 5.1 percent (1,017) being unemployed in June 1973. 7/ Most of the employment in Lauderdale County is created by: (1) government, (2) wholesale and retail sales, (3) services, (4) textiles and apparel, and (5) construction. Also, residents in Lauderdale County find employment at an aluminum plant or motor company in nearby Colbert County.

Wayne County, Tennessee has a total work force of 4,010 with an unemployment rate of about 5.5 percent. 8/ Major sources of employment are: (1) apparels, (2) lumber and wood products, (3) metals and machinery, and (4) leather products.

The economy of the area has improved during the last 10 years. Manufacturing industry has increased employment about 28 percent during this period. Retail trade employment increased about 30 percent, service industry employment 47 percent, and employment in government increased 20 percent. The economy of the area has been greatly improved by the regional development programs of TVA.

It is expected that the economy of Cypress Creek Watershed will be affected by the eight-county Tennessee Valley Resource Conservation and Development (RC&D) Project. Neither Lauderdale nor Wayne County are in the project area, but two counties adjoining Lauderdale are in the RC&D project area. Since some markets for products produced in these adjoining counties are in Lauderdale County, the economy of the watershed will be affected.

Forest products average $5 per cord for pulpwood and $40 per thousand board feet of mostly hardwood sawtimber. Stocking averages about 750 board feet per acre of sawtimber and one cord of pulpwood per acre.

Plant and Animal Resources 20/ 21/

Plant Resources

Commercial forest types include shortleaf pine, loblolly pine, oak-gum cypress, elm-ash-soft maple, oak-hickory, blackjack oak-post oak, yellow pine-hardwood, and cedar-hardwood. 9/

The forest lands of the steep, dissected upper portion of the watershed are oak-hickory type. The dominant overstory species on the ridges and upper slopes with southern exposures include post oak (Quercus stellata), blackjack oak (Q. marilandica) and hickory (Carya spp.). White oak (Q. alba), southern red oak (Q. rubra falcata), northern red oak (Q. rubra var. borealis), yellow-poplar (Liriodendron tulipifera), and elm (Ulmus sp.) are significant species in the overstory on toe-slopes and on slopes with northern exposures. Beech (Fagus grandifolia) and sycamore (Platanus occidentalis) are common on soils that have abundant moisture. The American chestnut (Castanea dentata) was one of the dominant species of this area before it was eradicated by blight.

The secondary stratum of the upper portion of the watershed includes dogwood (Cornus spp.), eastern redbud (Cercis canaden sis), sassafras (Sassafras albidum), and smaller trees of the dominant species.

The understory includes various shrubs, vines, legumes, grasses, and forbs. Dominant grasses, legumes, and forbs include low panicums (Panicum spp.), three-awn (Aristida sp.), broomsedge (Andropogon virginicus), little bluestem (A. scoparius), Elliott beardgrass (A. elliotti), purpletop (Tridens flavus), perennial lespedezas (Lespedeza virginica, L. violacea, L. procumbens), and aster (Aster sp.). Indiangrass (Sorghastrum nutans), switchgrass (Panicum virgatum), plumegrass (Erianthus alopecuroides), and longleaf uniola (Uniola sessiliflora) are sometimes found on the more fertile and moist sites. Grasses, legumes, and forbs are more abundant on areas where the overstory canopy is sparse or has been temporarily reduced by timber harvest.

Forest lands of the more gentle to moderately sloping uplands have more diversity of plant species. Red oaks, white oaks, and yellow poplar are more abundant in the composition and the blackjack and post oak decline in number. Hackberry (Celtis occidentalis), sweetgum (Liquidambar styraciflua), and maples (Acer spp.) often occur as dominant overstory species. The secondary stratum contains the same species as found in the steep, dissected area as well as additional species such as box elder (Acer negundo), iron wood (Carpinus caroliniana), and black cherry (Prunus serotina).

The understory also has more diversity of plant species than the steep, dissected upland. Wild ryes (Elymus spp.) little barley (Hordeum pusillum), perennial tickclovers (Desmodium spp.), honeysuckle (Lonicera japonica), wild vetches (Cicia spp.), and partridge pea (Cassia spp.) are abundant species in some areas.

Forest lands of the flood plain range from oak-hickory to gum-oak-sycamore to willow-gum-cypress. The dominant overstory of oak-hickory is most consistant in the upper portion of the flood plain. Sycamore and yellow poplar are also common on streambanks in the upper portion.

The sweetgum-oak-sycamore type appears to be most common in the middle and lower portions of the flood plain. The apportionment of individual species varies greatly from one site to another. Some areas that have regenerated from abandoned fields are composed almost entirely of one or two overstory species with no secondary stratum.

There is a great diversity of vines and shrubs in the middle and lower portions of the flood plain; however, grasses and forbs are limited to those that are extremely shade tolerant or plants that make much of their growth during the cool seasons. Low panicums, uniola, wild rye, and stinging nettle (Tragia urticifolia) are commonly found in these areas.

The willow-gum-cypress community is associated with wet or swampy soils. The black willow (Salix nigra) occupies areas that have abundant soil moisture and may or may not have ponded water during parts of the year. The willow is usually one of the first woody plants to become established near the normal water level of man-made stream channels. The river birch (Betula nigra) is often found in association with black willow.

The bald cypress (Taxodium distichum) grows in swamps in the lower part of the flood plain. This cypress grows in areas too wet for other trees. It also grows in composition with other overstory species along the edges of swamps. Water tolerant plants such as button bush (Cephalanthus occidentalis), sedges (Cyperus spp.), cattail (Typha latifolia), rushes (Juncus spp., Scirpus spp.), and cutgrass (Leersia spp.) are common in the shallow water edges of swamps.

Pine monoculture is not common in the watershed. A few areas in the upper portion of the watershed have been clear cut and planted to loblolly pine (Pinus taeda). These plantings are in early development stages. Native grasses and forbs become established during the first growing season after trees are planted. They continue to increase in

variety and volume until the pine canopy closes and reduces sunlight at their level. This usually occurs between 5 and 8 years after the trees are planted.

A few small fields of planted pines occur throughout the watershed. Their ages vary from small seedlings to trees of harvestable age. Most of these plantings appear to have been made in abandoned fields.

Unmolested secondary plant succession in abandoned fields is not common in the watershed. Most abandoned cropland fields are converted to pasture by some degree of grassland management. The abandoned fields that do occur are usually too small to use as economical pasture units. The early stages of plant succession appear to be closely related to typical Piedmont sites described by Oosting, 10/ Billings, 11/ and Odom. 12/ First invaders include crabgrass (Digitaria sanguinalis), horse weed (Erigeron canadensis), and fall panicum (Panicum dichotomiflorum). Soils that are moist and fertile often have plants such as Johnsongrass (Sorghum halepense) and cocklebur (Xanthium pensylvanicun) in the invader composition. Prairie three-awn is one of the first plants to become established on severely eroded, low fertility soils. Asters, common ragweed (Ambrosia artemisiifolia), goldenrod (Solidage spp.), poor joe (Diodia teres), broomsedge, and little barley become dominant during the second, third, and fourth growing seasons. The grass-shrub stage includes bluestems (Andropogun spp.) goldenrod, ragweed, asters, common greenbriar (Smilax rotundifolia), blackberry (Rubus sp.), dewberry (Rubus trivialis), sumac (Rhus sp.), persimmon (Diospyros virginiana), and numerous other native species. Dominant forest-type species become significant during the latter part of the grass-shrub stage. Pines (Pinus spp.) are not common in secondary plant succession in Cypress Creek Watershed.

Plant communities on cropland in the watershed are almost stable systems. Farmers desire to maintain single species in their cultivated row crop fields. They use cultural, mechanical, and chemical methods to curtail the invasion of weeds.

The principal crops grown are soybeans, corn, and cotton. Weeds common in these crops include crabgrass, pigweeds, lambsquarters, cocklebur, Johnsongrass, morning-glories, ragweeds, fall panicum, nutsedge, goose-grass and prickly sida.

Plant communities in improved pastures and haylands are highly managed systems--the objectives are to retain stands of planted species.

Tall fescue (Festuca arundinaceo) and white clover (Trifolium repens) in combination is by far the most important pasture mixture. The most common native invaders are grasses and forbs that produce most of their

growth during summer. Weeds commonly found in fescue-clover pastures include broomsedge, ragweed, aster, goldenrod, dogfennel, bitter sneezeweed and foxtail. Naturalized plants such as bermudagrass and Johnsongrass are common invaders. Curly dock is found on wetter soils.

Improved haylands include the fescue-clover mixture, coastal bermudagrass, and annual lespedezas (Lespedeza stipulacea, L. striata). Weed composition of the fescue-clover mixture is similar to that of fescue-clover pastures. Weeds that invade coastal bermudagrass include little barley, crabgrass, goosegrass, and nutsedges. Annual lespedeza must re-establish itself or be seeded every year; therefore, many native grasses and forbs have an equal or better chance of becoming a part of the composition.

The composition of unimproved pastures usually contains a few introduced plants such as fescue, annual lespedezas, white clover, and Dallisgrass (Paspalum dilatatum). But more than half of them are either native or naturalized plants such as broomsedge, little bluestem, native paspalums, bermudagrass, crabgrass, purpletop, hop clovers, and other grasses, forbs, and legumes. Woody plants such as sassafras, persimmon, and hickory are often present because annual mowing is not a common practice.

Annual pastures are grown on a few farms. Summer annual pastures are usually millet (Pennisetum glaucum), sudangrass (Sorghum vulgave var sudanense), or hybrid sorghum. Cool season pastures consist of single species of mixtures of small grain, annual clover, and ryegrass (Lolium multiglorum). These are highly managed pastures that occupy the land only a few months each year; therefore, weeds are not a problem.

Game Resources

Fishing activity is highest in the lower reaches of Cypress Creek and its major tributaries. Fisherman frequently fish from boats in the portion of Cypress Creek between Rash Road and Pickwick Lake. Rash Road marks the northern limit of boat fishing. According to the Tennessee Wildlife Resource Agency, stream fishing is popular locally and is described as fair for bass, sunfish, rockbass, and catfish in the Tennessee portion of the watershed.

The principal species of sport fish are white lake bass (Monrone chrysops), largemouth bass (Micropterus salmoides), spotted bass (Micropterus punctulatus), smallmouth bass (Micropterus dolomieui), rock bass (Amblo-plites rupestris), bluegill (Lepomis macrochirus), catfish (Ictalurus punctatus), and crappie (Pomogis spp.). 21/ During spawning season sauger and white lake bass travel to the upper reaches of Cypress Creek and its tributaries.

The watershed contains an abundance of good habitat for upland game. Sixty-three percent or 84,992 acres of the watershed is forest land, with 93 percent of these forests being hardwoods. The remaining 7 percent are mixed hardwoods and pines. These forests also provide habitat for many species of non-game animals.

Farm game such as rabbits, doves, and quail benefit from the 15,947 acres of cropland in the watershed. Idle land, field borders, grain fields, and the edge between open lands and woods provide good habitat for farm game.

Rabbit, squirrel, and quail populations are moderate. Hunting is moderate for rabbits and squirrels.

Dove populations are generally low throughout the watershed; however, doves sometime congregate during fall and winter in larger grain fields. Hunting for doves is generally low.

Deer and wild turkey populations are considered low but seem to be on the increase. Deer were stocked about 5 miles east of the watershed in 1961 and 1962. 19/ This nucleus deer herd is expected to increase in both numbers and range. It will probably populate the project area.

A fox hunting club owns a lodge and kennel in the upper reaches of the watershed.

Mink and muskrat populations are low to moderate, and trapping activities for these furbearers are low.

Raccoon populations are moderate. Hunting for raccoons is moderate, also. Beaver and waterfowl populations are sparse; as game animals, they are not important in the watershed.

Both game and non-game animals represent opportunities for nature study wildlife photography, and other non-consumptive uses. State and national recreational demand studies indicates an increase in these types of activities for the next 25 years.

Non-Consumptive Wildlife Resources

Two studies were conducted to collect plant and animal resource data on the Cypress Creek Watershed. The first study was prepared in the fall of 1973 by Dr. Paul Yokley, Professor of Biology, University of North Alabama, and assisted by Authur L. Hershey, Professor of Biology, University of North Alabama and Charles H. Gooch, Biologist, Coffee High School, Florence, Alabama. 20/ Attention was given to rare or endangered organisms in the watershed. The present distribution, the hypothetical

distribution, and the threat over the range of this watershed are discussed. The list of animals includes most macroscopic invertebrates and vertebrates which have been recorded in the watershed in the past fifty years. Many of each category have been collected or observed by the authors during the past ten years. Every main tributary of the drainage has been observed and collected. The recorded specific type of habitat required for the larger aquatic invertebrates and vertebrates has been the basis for this report.

The quality of the existing terrestrial and aquatic habitats has been described. The water quality parameters that have been recorded include temperature, pH, and dissolved oxygen. General observations concerning the changes in the watershed over the past twenty-five years are discussed.

Yokley's study concentrated on Mollusca which includes clams, mussels, and snails. Dr. Yokley is a recognized authority on this group of animals.

Another report was prepared by Dr. Herbert T. Boschung, Professor of Biology, University of Alabama and Thomas S. Jandebeur, Graduate Teaching Assistant, University of Alabama. 21/ This report concerned all fauna in the watershed but emphasized fishes, on which the authors are considered authorities.

Invertebrates:

There are no known threatened or endangered invertebrates in the project area. Invertebrate organisms characteristic of the Cypress Creek Watershed are listed in Yokley's report. 20/ The aquatic habitats in the Cypress Creek drainage area have been steadily decreasing in quality over a period of years. Sediment and debris which result from clearing and cultivating steep areas and removal of this sediment have many destructive effects on aquatic biota including invertebrates.

The lower parts of Cypress Creek appeared turbid and silt laden during most of the summer of 1973. Some of the more silt-sensitive invertebrate species, such as most fresh water mussels, can easily be destroyed by silt. Little Cypress Creek has less debris and silt deposits than Cypress and Middle Cypress Creeks. As a result, Little Cypress has a more diverse fauna and greater densities of each species. Invertebrates are extremely important as food for vertebrates such as fish.

Silt is extremely damaging to the mollusk family Unionidae or fresh-water mussels. Sharp's Mill Dam located on Reach XXIII of Little Cypress

Creek has served as a settling basin for silt removal and mussels are concentrated in the entire length of Little Cypress Creek area below Sharp's Mill Dam whereas they are scarce or non-existent throughout the rest of the drainage area. 20/

Other limiting factors for mollusks in the uppermost tributaries of the Cypress Creek drainage, with the exception of Little Cypress, are the low pH values and deficiency of calcium salts. No snails or bivalved mollusks were collected in upper tributary streams containing small amounts of dissolved calcium carbonates. Snails were collected in the upper reaches of Little Cypress Creek and 13 species of mussels were found in this tributary.

Yokley lists 3 families, 12 genera and 26 species of clams and mussels, and 6 families and 12 genera of snails from the Cypress Creek Watershed.

Vertebrates:

Both Yokley and Boschung collected a tremendous amount of information on the fishes of the Cypress Creek Watershed. Yokley has made collections on these streams for the past ten years and has access to information collected over 50 years. Boschung also has access to information gathered before the present work. He used data from 72 collections made prior to the 1974 study, which was comprised of 71 collections. Altogether 143 fish collections from 89 sites (see appendix J) were used. Boschung's work included 27,808 individual fishes representing 14 families, 31 genera, and 56 species.

Summary statistics for total number of individuals, overall percent relative abundance, and overall percent encounter based on 102 collections from the watershed exclusive of collections from springs, Sharp's Mill Reservoir, or otherwise incomplete collections are listed on the following page.

Fish and other vertebrates listed as threatened or endangered by the Alabama Department of Conservation and Natural Resources are divided into three categories; Threatened, Endangered, and Special Concern. The publication Rare and Endangered Vertebrates of Alabama was published in 1972 and is presently being revised.

Percent encounter (PE) and percent relative abundance (PRA) by major tributaries. Based on 101 collections. Number in parentheses = number of fish collections from major tributary.

PRA = percent relative abundance; total number of individuals of species collected in major tributary divided by the total number of individuals of all species collected from that major tributary.

PE = percent encounter; total number of encounters with a species in tributary stream divided by the total number of collections from that tributary.

Species	Burcham Creek (7)		Lindsey Creek (16)		Big Cypress Creek (25)		Middle Cypress Creek (21)		Little Cypress Creek (24)		Cox Creek (5)		Main Cypress Creek (3)	
	PRA	PE	PRA	PE	PRA	PE	PRA	PE	PRA	PE	PRA	PE	PRA	PE
Ichthyomyzon gagei	-	-	0.17	18.75	0.14	20.00	0.05	9.52	0.02	4.17	0.30	20.00	-	-
Lampetra aepyptera	-	-	0.21	12.50	-	-	0.03	4.76	0.03	8.33	-	-	-	-
Lepisosteus osseus	-	-	-	-	-	-	-	-	-	-	-	-	0.24	33.33
Dorosoma cepedianum	-	-	-	-	0.03	4.00	-	-	-	-	0.30	20.00	1.21	33.33
Esox niger	0.20	28.57	0.25	31.25	0.29	24.00	0.24	33.33	0.02	4.17	-	-	0.24	33.33
Campostoma anomalum	5.30	71.43	7.35	81.25	5.13	68.00	6.18	95.24	15.55	100.00	23.47	100.00	12.11	100.00
Clinostomus funduloides	12.86	85.71	24.47	93.75	35.43	100.00	27.26	95.24	12.50	100.00	10.46	80.00	-	-
Hemitremia flammea	2.06	28.57	1.94	18.75	3.83	60.00	1.49	57.14	2.92	37.50	1.34	20.00	0.97	33.33
Hybopsis amblops	-	-	-	-	-	-	-	-	3.49	29.17	-	-	0.97	66.67
Notemigonus crysoleucas	-	-	-	-	0.34	28.00	-	-	-	-	-	-	2.65	33.33
Notropis ardens	16.68	71.43	14.29	43.75	9.67	52.00	34.15	71.43	23.29	75.00	0.60	20.00	20.34	66.67
Notropis atherinoides	-	-	-	-	-	-	-	-	-	-	0.15	20.00	0.97	33.33
Notropis chrysocephalus	7.26	42.86	1.78	50.00	4.10	44.00	3.36	61.90	8.64	83.33	9.27	40.00	20.58	100.00
Notropis coccogenis	-	-	-	-	0.38	20.00	-	-	0.31	12.50	1.05	20.00	11.62	66.67
Notropis fumeus	3.53	28.57	0.04	6.25	0.03	8.00	-	-	0.30	12.50	-	-	4.84	33.33
Notropis sp. lepterus	-	-	-	-	-	-	-	-	-	-	-	-	0.17	66.67
Notropis telescopus	-	-	-	-	0.05	4.00	1.30	33.33	-	-	-	-	-	-
Notropis whipplei	-	-	-	-	-	-	-	-	-	-	0.15	20.00	-	-
Phoxinus erythrogaster	2.26	28.57	0.42	18.75	3.50	64.00	3.59	47.62	0.20	20.83	-	-	-	-
Pimephales notatus	0.10	14.29	-	-	0.03	4.00	0.02	4.76	0.52	29.17	0.60	20.00	-	-
Rhinichthys atratulus	-	-	-	-	9.01	48.00	0.20	14.29	0.97	45.83	0.45	20.00	-	-
Semotilus atromaculatus	14.82	85.71	5.41	87.50	8.17	88.00	6.23	95.24	4.46	58.33	10.16	60.00	-	-
Catostomus commersoni	-	-	-	-	-	-	0.02	4.76	-	-	0.15	20.00	-	-
Erimyzon oblongus	1.67	42.86	0.13	12.50	0.12	8.00	0.11	19.05	-	-	-	-	-	-
Hypentelium nigricans	2.45	57.14	1.94	68.75	1.49	76.00	1.52	52.38	2.13	79.17	3.29	80.00	0.24	33.33
Minytrema melanops	-	-	-	-	0.02	4.00	0.09	14.29	0.08	8.33	-	-	0.24	33.33
Moxostoma duquesne	0.10	14.29	-	-	0.09	16.00	-	-	0.39	20.83	0.15	20.00	1.21	66.67
Moxostoma erythrurum	-	-	0.04	6.25	-	-	-	-	0.02	4.17	0.15	20.00	0.24	33.33
Ictalurus natalis	-	-	-	-	0.12	8.00	-	-	-	-	0.45	20.00	-	-
Aphredoderus sayanus	-	-	0.04	6.25	-	-	0.03	4.76	-	-	-	-	-	-
Fundulus catenatus	-	-	0.04	6.25	0.51	12.00	0.75	38.10	0.13	8.33	-	-	-	-
Fundulus olivaceus	9.22	71.43	4.40	87.50	0.92	40.00	1.15	57.14	1.03	50.00	1.94	40.00	2.42	33.33
Cambarus affinis	-	-	0.46	37.50	-	-	0.08	9.52	0.03	4.17	0.75	40.00	0.48	33.33
Amblopliites rupestris	-	-	0.04	6.25	0.02	4.00	0.06	19.05	0.10	12.50	-	-	-	-
Lepomis cyanellus	3.34	71.43	1.99	56.25	3.66	68.00	1.16	57.14	3.23	58.33	8.52	100.00	0.48	33.33
Lepomis macrochirus	0.78	57.14	1.14	43.75	0.48	52.00	0.90	57.14	0.84	66.67	2.69	100.00	3.63	66.67
Lepomis megalotis	1.96	42.86	0.72	37.50	0.24	20.00	0.20	19.05	0.18	25.00	0.90	40.00	1.21	66.67
Lepomis microlophus	-	-	-	-	-	-	-	-	-	-	-	-	0.73	66.67
Micropterus dolomieui	-	-	0.04	6.25	-	-	0.02	4.76	-	-	0.15	20.00	-	-
Micropterus punctulatus	-	-	0.17	18.75	-	-	-	-	-	-	0.45	20.00	2.66	66.67
Micropterus salmoides	-	-	0.30	25.00	0.07	16.00	0.09	19.05	0.16	25.00	0.15	20.00	0.73	33.33
Etheostoma blennioides	-	-	-	-	-	-	-	-	0.59	25.00	-	-	0.48	33.33
Etheostoma blennius	-	-	-	-	0.03	8.00	0.03	4.76	0.10	12.50	-	-	-	-
Etheostoma boschungi	-	-	1.87	56.25	1.49	28.00	0.30	14.29	-	-	-	-	-	-
Etheostoma caeruleum	-	-	1.14	31.25	0.03	8.00	0.42	33.33	2.74	50.00	-	-	-	-
Etheostoma duryi	2.84	57.14	15.04	100.00	1.28	52.00	2.93	66.67	3.16	75.00	7.47	80.00	0.73	66.67
Etheostoma flabellare	-	-	0.36	75.00	3.38	96.00	1.11	57.14	1.51	70.83	4.93	40.00	0.73	66.67
Etheostoma jessiae	-	-	-	-	-	-	-	-	1.06	8.33	-	-	-	-
Etheostoma rufilineatum	-	-	-	-	0.02	4.00	0.05	9.52	2.16	37.50	-	-	1.21	66.67
Etheostoma simoterum	-	-	0.34	18.75	-	-	0.05	4.76	2.15	45.83	1.64	40.00	0.97	33.33
Etheostoma squamiceps	9.72	85.71	7.23	87.50	3.98	88.00	3.34	85.71	1.36	45.83	1.50	40.00	0.24	33.33
Etheostoma zonale	-	-	-	-	-	-	-	-	0.15	8.33	-	-	-	-
Percina caprodes	0.98	28.57	-	-	0.08	8.00	0.09	4.76	1.05	37.50	2.39	80.00	0.73	33.33
Aplodinotus grunniens	-	-	-	-	-	-	0.03	4.76	-	-	0.30	20.00	-	-
Cottus carolinae	1.86	57.14	3.08	37.50	1.83	76.00	1.84	85.71	2.42	79.17	3.74	100.00	2.18	66.67

Source: Report by H. T. Boschung on Fauna of Cypress Creek Watershed.

Definitions used to revise this list of species in Alabama are as follows:

Endangered Species -- Those species in danger of extinction throughout all or a significant portion of their range in Alabama.

Endangered species are those whose prospects for survival are in immediate jeopardy. An endangered species must have help, or extinction and/or extirpation from Alabama will probably follow.

Threatened Species -- Those species which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range in Alabama.

Special Concern -- Those species which must be continually monitored because eminent degrading factors, their limited distribution in Alabama or other physical or biological characteristics, may cause them to become threatened or endangered in the foreseeable future.

The following fish are discussed in the Yokley and Boschung reports under rare and endangered species:

Rare-1. (Special Concern) Etheostoma blennius (Blenny darter). This darter inhabits moderate to very swift riffles and seems to prefer areas with larger stones on the stream bottom. The blenny darter is endemic to Alabama and Tennessee. Yokley concluded that this darter is not common in any portion of the drainage, but occurs in all of the larger streams. Boschung found this darter to be fairly common in Cypress and Shoal Creeks.

The blenny darter is on the federal list of threatened wildlife of the United States 22/. This darter was collected at six localities by Boschung. 21/

Rare-1. (Threatened) Etheostoma tuscumbia (Tuscumbia darter). This fish is strictly confined to large springs in the Tennessee Valley in North Alabama and Southern Tennessee. It has been collected in the Cypress Creek Watershed only in King Spring, a tributary to Cox Creek. 21/

Rare-2. (Special Concern) Notropis ariommus (Popeye shiner). Notropis boops (Bigeye shiner). Noturus miurus (Brindled madtom). These species have not been collected recently and probably do not exist in the area. An investigator found these fish in the area and listed them in an 1891 publication. 23/

Rare-2. (Special Concern) Notropis coccogenis (Warpaint shiner). This shiner probably prefers cool silt-free water and occupies streams in much of the area. 21/

Rare-2. (Special Concern) Phoxinus erythrogaster (Southern redbelly dace). This fish inhabits springs, spring fed streams and other small headwater streams. Yokley found this species to be most abundant in Burcham Creek and North Fork Branch. 20/ 21/

Threatened. Etheostoma boschungi(Slackwater darter). Boschung, states that it is known in Alabama only from the Cypress Creek Watershed and from three localities in the Flint River drainage. In Tennessee, this darter is known from the upper parts of Cypress and Middle Cypress and from one locality in the Buffalo River. 21/

Yokley found the slackwater darter most abundant in Lindsey Creek and North Fork Branch, with some collections being made in Middle Cypress and Burcham Creeks. Boschung indicated that this may be the most restricted species in the watershed.

The following fish classified as "Special Concern", inhabit the watershed: 21/

Hemitremia flammea - Flame chub
Notropis telescopus - Telescope shiner
Notropis fumeus - Ribbon shiner
Rhinicthys atratulus - Blacknose dace
Noturus exilis - Slender madtom
Etheostoma jessiae - Blueside darter
*Lagochila lacera - Harelip sucker
*The harelip sucker is probably extinct.
Percina sciera - Dusky darter

Other rare and endangered herptiles, birds, and mammals discussed in Boschung's report are as follows:

Rare

Accipiter striatus - Sharp-shinned hawk
Accipiter cooperii - Cooper's hawk
Aguila chrysaetos - Golden eagle
Haliaeetus leucocephalus - Bald eagle
Pandiun haliaetus - Osprey
Falco peregrinus - Peregrine falcon
Sorex longirostris longirostris - Southeastern shrew
Myotis austroriparius austroriparius - Southern eastern myotis
Lasiurus cinereus cinereus - Hoary bat

Endangered

Thryomanes bewickii - Bewick's wren
Myotis Sodalis - Indiana myotis

Recreational Resources

Opportunities for outdoor and water-based recreation in the watershed are limited primarily to fishing along the streams and hunting of small game.*

A wide variety of recreational resources, however, are available in the surrounding areas to watershed residents. A summary of these resources is as follows:

TYPE RECREATION	NO. AREAS 13/
Beach area	3
Big game habitat	1
Boat launching areas	7
Camping	5
Driving range - golf	2
Golf courses	4
Historical sites	2
Indian museum	1
Marinas	7
Picnic area	13
Playfields (softball, baseball, etc.)	4
Riding club	1
Reservoir, lake or fish pond	6
Small game habitat	3
Tennis courts	2
Waterfowl habitat	1

Cypress Creek was studied for inclusion in a statewide (Alabama) plan for wild and scenic rivers but was not included by the State of Alabama. It has poor flow characteristics, a large number of road crossings, and is clogged with sediment and debris. 13/ The study recommended in part "that consideration be given to restoring Cypress Creek to a free-flowing stream. This may be possible by dredging and other slight alterations without major stream channel improvement". This point is further elaborated in the following quote: "Cypress Creek has a low total recreational use at present and this use will likely decrease as streamflow characteristics deteriorate further. However, fishing provides heavy recreational use during certain periods of the year. Improvements to restore the stream to its natural free-flowing condition may be possible. If so, the stream might then become a state administered recreational river." 13/

*The City of Florence has developed a portion of the TVA-owned land in the watershed into a recreational area.

Excellent facilities for water-based recreation and fishing are available on the nearby large reservoirs on the Tennessee River. Swimming, picnicking, camping, golfing, fishing, and playing softball are activities in which people of the area participate most often. Most recreational facilities are open to the public. About 17.5 miles of the Natchez Trace Parkway crosses the western portion of the watershed. This parkway offers many site seeing opportunities. Portions of two wildlife management areas of about 15,000 acres are open to the public for hunting small game.

Archaeological, Historical, and Unique Scenic Resources

During the summer of 1974 the University of Alabama, Department of Anthropology conducted an archaeological site survey of the watershed for the Soil Conservation Service. Fifty-nine sites of archaeological importance were located through the survey. A majority of the sites, 28 in all, are situated on Cypress Creek and its tributaries including 23 campsites and 5 undetermined sites. Eleven campsites, 2 undetermined, and 1 small village site were found on Middle Cypress Creek and its tributaries. On Little Cypress Creek and its tributaries 13 sites, 2 undetermined, 1 village, and 1 bluff shelter were found. The report titled Cypress Creek Watershed Archaeological Site Survey contains specific data for each of the 59 sites indicating type of site, specific location, description, previous excavations, artifacts collected, cultural content, summary, and recommendation. This report is available for review at the USDA, Soil Conservation Service, Auburn, Alabama.

According to the National Register of Historic Places of February 4, 1975 and succeeding monthly supplements the following historic sites are located within the watershed.

Lauderdale County - Florence, Courtview (Rogers Hall, Florence State University) Court Street (6-13-74).
Florence, Karsner-Carroll House, 303 North Pine Street.
Florence, Larimore House, Mars Hill Road (11-21-74).
Florence Wesleyan Hall, Florence State University, Morrison Avenue (6-20-74).

Soil, Water, and Plant Management Status

During the period 1964 to 1969 there was a slight decrease in harvested cropland in Lauderdale County. Data from 1969 to 1972 shows about a

20 percent increase in cropland in the county. 14/ 15/ Soybeans were the main crop acreage increase. These changes in the county are representative of the Alabama portion of the watershed. The changes in Wayne County are much less than those in Alabama.

Overall during this period there has been only a slight increase in cropland and pastureland and a slight decrease in forest land.

The Wayne County Soil Conservation District and the Lauderdale County Soil and Water Conservation District were organized in the 1950's by interested landowners to encourage the application of needed conservation land treatment measures. Technical assistance is supplied to these districts by Soil Conservation Service personnel headquartered at Waynesboro, Tennessee and Florence, Alabama and landowners in the development of resource conservation plans and the application of needed land treatment measures. The Lauderdale County S&WCD has a regularly scheduled television program in Florence. The program informs landowners and operators about conservation services that are available and of conservation measures that have been applied.

An inventory of both conservation plans and progress reports for farms in the watershed shows that progress is being made in the application of conservation land treatment measures. In August 1973, 205 of the 1,145 farms in the watershed had conservation plans. These plans cover over 17 percent of the watershed. Adequate land treatment has been applied on about 800 acres of cropland and 5,900 acres of grassland by the application of the above conservation practices. It is estimated that about 35,000 acres of forest land and 7,500 acres of idle, urban and miscellaneous lands are adequately protected from deterioration, either naturally or by action of landusers with or without SCS assistance.

The following table lists conservation measures and practices that were planned before August 1973.

LAND TREATMENT DATA
Cypress Creek Watershed

Conservation Practices & Measures	Unit	Planned	Applied to Date
Conservation cropping system	Ac.	861	699
Field border	Ft.	600	2,400
Ponds	No.	154	98
Grassed waterway	Ac.	122	54
Pasture and hayland planting	Ac.	4,495	2,664
Terracing	Ft.	4,250	2,650
Wildlife upland habitat management	Ac.	73	73
Drainage field ditches	Ft.	2,400	2,400
Drainage mains and laterals	Ft.	2,650	2,650
Pasture and hayland management	Ac.	9,222	5,877
Tree planting	Ac.	499	76
Contour farming	Ac.	319	180
Crop residue management	Ac.	623	403

Technical assistance to landowners for planning forestry measures is available from the Alabama Forestry Commission and the Tennessee Conservation Department, Division of Forestry within the going Cooperative Forestry Management Program.

TVA has a resource development program for developing and protecting agricultural resources. This program should continue promoting new ideas and getting helpful information to rural people.

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WATER AND RELATED LAND RESOURCE PROBLEMS

Land and Water Management

The broad concept of resource conservation has been accepted by a portion of the farmers in the watershed as evidenced by their individual progression applying conservation measures to their lands. It is apparent that many farms are marginal to submarginal as an economic unit due to their small size. The rate of application of land treatment measures on the smaller farming units is slow because the landowners lack the necessary capital and management skills for applying needed treatment. These landowners and operators are more likely to use the land beyond its capabilities. Intensive cropping and high rates of erosion are commonly found on these smaller farms. 1/

Soil erosion has reduced the fertility and water holding capacity of the soil. Soil erosion is most severe on the soils that have greater than one percent, or one foot fall per 100 feet length of slope. The farming of steep slopes has resulted in irregular shaped fields which are not conducive to use of modern farm equipment.

Severe erosion occurs on about 60 acres of roadbanks, field gullies, and borrow pits. Research in Georgia on similar roadbanks indicates that soil losses from erosion range from 25 to 359 tons per acre each year. 2/

The soils of the flood plains have problems resulting from excess water causing: (1) direct damage to cultivated crops by flooding: (2) added expenditures of labor, capital, and energy to re-prepare seedbeds and replant crops: (3) reduced quantity and quality of row crops and pastures and, (4) physical damage to soils.

More efficient uses of labor, capital, energy, and management are needed on farms. Landowners and operators can apply and maintain conservation measures if they can get the money and technical help.

Wildfire on forest lands is a problem throughout the watershed. Wildfires damage timber, wildlife, and other resources. They burn about 1.31 percent of the forest land each year in the Alabama portion of the watershed and about 0.76 percent in the Tennessee portion. An acceptable level is considered to be 0.2 percent.

Floodwater Damage

Damages to crops and pastures on flood plain lands are extensive throughout the watershed. Crops are often destroyed by floodwater, but a

significant portion of the damages is related to delayed planting and harvesting with resultant increases in the cost of producing the crop and decreases in crop yields and quality of the product. These damages have forced operators to manage flood plain land well below the actual potential of the soils, resulting in reduced yields and incomes.

Flooding occurs on about 10,321 acres of flood plain land along Cypress Creek and its tributaries (see appendix C). This is the flood plain that would be inundated from a 100-year frequency flood event. At the present time land use in the flood plain is about 19 percent corn, 6 percent cotton, 6 percent soybeans, 45 percent pastureland, 22 percent forest land, and 2 percent idle and miscellaneous.

Frequent floods are severely limiting production in the flood plains. Because of their frequency, the small floods cause more total damage than the large infrequent ones. These floods hinder the production of row crops; and, in some cases, have caused portions of the flood plains (an estimated 600 acres) to be taken out of agricultural production.

Segments of stream channels delay flow because they have restrictions which decrease their widths and depths. These restricted segments are 100 feet to over 1,000 feet long. They consist of trees growing in the channel, large gravel bars, logjams, and dense woody growth. These restrictions reduce channel carry capacities. Some restrictions are causing channel banks to erode or undercut producing downstream sediment.

There are about 320 landowners that suffer floodwater damages annually. There are no residences or businesses in the flood hazard area.

Other agricultural damages occur to about 50 miles of fences, numerous agricultural buildings, drainage ditches, and farm roads. Because of frequent flooding, it is not economical to build fences on parts of the flood plain. Both fence repair and removal of flood debris are necessary several times a year on existing fences.

Nonagricultural damages are significant because of the number of roads subject to damage and the number of people affected when roads are damaged. Some roads are closed several times every year. When roads are closed, it is necessary to reroute traffic. School buses and rural mail deliveries are also affected. Road fill must be replaced.

The flood plain was divided into 26 reaches for evaluation purposes. The extent of flooding is shown in the following tabulation (see page 56).

Reach	Acres flooded			
	100-yr.	25-yr.	2-yr.	1-yr.
I	282	256	145	74
II	360	351	241	182
III	461	436	338	272
IV	23	22	11	6
V	418	414	362	336
VI	341	324	230	155
VII	642	629	567	531
VIII	353	329	226	175
IX	849	804	535	410
X	176	169	94	43
XI	325	303	215	182
XII	139	135	104	67
XIII	579	561	455	364
XIV	781	706	415	307
XV	288	277	247	157
XVI	358	324	189	139
XVII	189	179	133	101
XVIII	624	593	392	290
XIX	1073	1064	930	593
XX	567	518	253	144
XXI	248	221	143	104
XXII	249	228	155	125
XXIII	134	123	90	75
XXIV	128	122	99	59
XXV	541	481	298	231
XXVI	195	181	149	110
TOTAL	10321	9749	7012	5230

The part of Cypress Creek between the confluences of North Fork and Lindsey Creeks has five to ten damaging floods each year. The rest of Cypress Creek and its tributaries have damaging floods two to five times each year. The average annual area flooded in the watershed is estimated to be 14,155 acres. This figure is an accumulation of the number of acres flooded by flood events during the year and averaged for the evaluation period.

On March 15-16, 1973, a storm of about 100-year frequency occurred. This storm flooded about 10,000 acres in the watershed. Crop and pasture damages, including sediment and scour, were estimated to be $120,000. Thirty cows drowned in the watershed as a result of this flood and one bridge and two culverts were washed out. A truck plunged into the creek due to the bridge wash out. The two people involved were rescued from the mishap.

Damages from flooding were found to average about $349,300 each year. Average annual damages to crops and pastures are about $183,300 and occur primarily in reaches V, VII, VIII, IX, XI, XIII, XIV, XIX, and XXV. Average annual damages to minor fixed improvements (other agriculture) are about $117,100 and occur generally in the same reaches as crop and pasture damages. Road and bridge damages occur mainly in reaches VII, VIII, IX, XIX, and XXV. These average $48,900 each year.

Indirect damages, estimated as a percentage of direct damages, are 10 percent of the agricultural damage, and 20 percent of road and bridge. These damages include delayed shipments of materials and products, loss of wages to employees, increased costs from rerouting traffic, and interruption of public utilities and services. Damages are estimated at $38,700 annually.

Erosion Damage

The present average erosion rates in the watershed by land use is as follows:

	Present Erosion Rate 3/ Tons/Acre/Year
Cropland	14.1
Pastureland	4.0
Forest land	2.5
Idle land	16.1
Misc. land	19.1

The cropland erosion rates exceed the rate which would allow sustained use of the soil resource for agricultural production. These high rates create problems downstream such as streams filling with sediment and sediment deposition on the flood plain. The average permissible rate of soil loss for the majority of soils in cropland is 4 tons per acre annually.

Critical (gully) erosion occurs on about 50 acres of abandoned borrow pits and field gullies. Critical roadside erosion is occurring on about 10 acres. These critical areas are eroding at an average rate of about 240 tons per acre per year.

Flood plain scour has damaged 3,355 acres of the flood plain, reducing the productive capacity of the damaged acres by 5 to 17 percent. Scour damages consist of (1) lowered production where topsoil has been lost and (2) increased cost of farming because the scour channels trap water, encourage weed growth and are difficult to cross with farm machinery. Average annual scour damage is estimated to be $19,700.

Floodwater on Little Cypress Creek, looking upstream from Rasch Road.

Floodwater on Cypress Creek looking upstream from Cloverdale-Threet Road.

4-34896 4-75

Flooding of this house and adjoining land was caused by Burcham Creek near Cloverdale in March of 1973.

This road was flooded by Burcham Creek near Cloverdale in March of 1973. Note the erosion of the shoulders in the lower left-hand corner.

4-34896 4-75

USDA-SCS-FORT WORTH, TEX. 1975

The general effect of upland erosion on agriculture and the economy of the area was not evaluated in monetary terms, but is considered to be serious and detrimental to the long-range use of the land.

Land eroding at the indicated rates will soon become uneconomical to farm and will be removed from agricultural production or become critical sediment producing areas or both. Either eventuality will have serious deterimental consequences to the economy from loss of production, to the environment from downstream sedimentation and to the aesthetic quality of the watershed.

Sediment Damage

Sediment damage to agricultural and urban lands is minor. Six miles of gravel road that cross the flood plain are frequently overtopped by flooding. Gravel washed from the road is deposited in the road ditches, channels and adjacent flood plain. This sediment does some damage to croplands and contributes to channel plugging but was not evaluated separately from floodwater damage. Removal of the gravel from road ditches and replacement of the road surface was evaluated as part of flood damage to road and bridges.

Swamping damage is the result of impaired drainage caused by sedimentation in and along channels. Land formerly usable becomes progressively swamped and unfit for the use to which it has been dedicated. Swamping has damaged about 15 acres of flood plain land in the vicinity of the Cooper Branch and Cypress Creek confluence and along the other stretches of sediment plugged channels in the watershed.

Sediment transported by Little Cypress Creek has been deposited in the reservoir formed by Sharp's Mill Dam resulting in an estimated 80 percent loss of reservoir capacity.

The most damaging sedimentation in the watershed is gravel that fills channels and increases the frequency and magnitude of flooding. This sediment results from the erosion of gravel from roadbanks, road surfaces, gullies, borrow pits, and other exposed areas. Sediment is introduced directly into streams at road crossings and from eroding channel banks.

Small, frequent storms tend to fill ditches and branches and scatter heavy sediment throughout the system, in effect storing the gravel in readiness for the large infrequent storms which move the sediment downstream into the constricted "plugged" areas.

In the vicinity of the confluence of Cooper Branch and Cypress Creek, sediment has accumulated to the extent that "channel plugging" has occurred and flooding takes place after every runoff producing storm (about 25 times per year). In other portions of the watershed channel fill is only partial and flooding is increased in proportion to the channel capacity lost to sediment filling.

The effect of sediment on water quality was not evaluated. Though agricultural chemicals are known to be transported at times by absorbtion on sediment particles, the City of Florence water treatment plant has recorded no serious water quality effect traceable to sediment.

Sediment is deposited in the Tennessee River by stormflows. Based on estimates of erosion in the watershed and the characteristics of the stream, the average annual sediment yield at the mouth of Cypress Creek is about 183,000 tons. An estimated 40 percent of the sediment is sand and gravel which moves as bedload. The remainder which are fine silt and clay is suspended in storm runoff. The average suspended sediment load is estimated to be 332 milligrams per liter. 3/ This sediment concentration is within the range of a fair warm-water fishery stream. 4/

Drainage Problems

Drainage problems in the watershed are minor. Wet areas are producing at only 75 percent of their capability and cover an area of about 180 acres. These areas are presently being used for pasture and consist mainly of the Lee and Lobeville soils.

Other wet areas in the watershed have received protection through the efforts of watershed residents. Practices already installed include 2,650 feet of drainage mains and laterals and 2,400 feet of drainage field ditches.

There is a need to install additional drainage mains and laterals and drainage field ditches to solve the drainage problems. These practices can be applied as part of the landowners conservation land treatment program.

Municipal and Industrial Water Problems

Cypress Creek is the source of water for the City of Florence (population 34,000), and the adjoining rural-residential areas. Total treatment and distribution of water is made by the Florence Water Authority

(51,000 customers). The present demand of these 51,000 customers is 5,774,000 gallons per day. Projections for 1990 indicate a demand of 11,548,000 gallons per day for 72,000 people. 5/ At its lowest flow, Cypress Creek furnished about 30,000,000 gallons per day. 6/

Ground water is of adequate quality and quantity for wells throughout the watershed. High yield wells could be developed in the lower portion of the watershed near Cox Creek. Elsewhere, the potential for extensive development of ground water supply is estimated to be low. 7/ There are no plans for water systems which depend on developing ground water.

Recreation Problems

Stream water quality of the watershed is adequate for contact sports, however, developed facilities for these purposes do not exist. An old mill pond known as Sharp's Mill Dam on Little Cypress Creek was developed for swimming with dressing rooms and concession facilities. This development was abandoned some years ago primarily due to sediment accumulation (present maximum water depth--four feet).

Cypress Creek from the Tennessee River up to the junction of Little Cypress Creek is utilized for boat fishing. Streambank fishing occurs around and near many of the road crossings of major streams. Sightseeing and picnicking are enjoyed along the Natchez Trace Parkway and other public roads passing through the watershed.

Even though a variety of nearby recreational resources are available to watershed residents and the general public, recreation resources within the watershed are limited to those mentioned above.

The population within 35 miles of the watershed is about 154,000 and the projected 1990 population is 184,000. 8/

The University of North Alabama is interested in water-related recreation. The University, which has about 4,000 students and 250 faculty and staff members, has expressed a need for water-based instructional and recreational facilities. Enrollment is expected to be 6,500 students by 1980.

With the abundance of nearby water-related recreational facilities available on the Tennessee River and its lakes, there is not an overall need for additional facilities.

Plant and Animal Problems

Land use trends in the watershed are toward slight increases in cropland and pastureland and a slight decrease in forest land. These trends should make no significant changes in plant communities.

Present trends indicate that land and water problems would result in more pasture being converted to cropland in the flood plain and more forest land being converted to grassland in the upland.

Because of sediment and other debris, aquatic habitats in the watershed have been decreasing in quality for at least a decade. This problem was discussed in detail in the Plant and Animal Resources Section under invertebrates.

The potentials are medium for both small game and big game hunting in Lauderdale County, Alabama. Potential for waterfowl hunting in the county is low. Lack of habitat limits the potential for waterfowl hunting. 9/ Big game hunting is practically non-existent in Wayne County, Tennessee. The small game hunting available to the public in Wayne County is probably not fully utilized.

Water Quality Problems

Water quality problems in the watershed are minor. Even though there is a slight increase in cropland area, there is expected only minor changes in water quality.

Economic and Social Problems

Lauderdale County, Alabama, is in the Appalachian Region and is eligible for benefits under the Appalachian Regional Development Act of 1965. About 70 percent of the farms in Lauderdale County have gross sales of less than $2,500 annually. 10/ About 20 percent of the farms in the county are designated by the Public Works and Economic Development Act of 1965 as being eligible for assistance. According to the 1969 Census of Agriculture, about 56 percent of the farms in Wayne County, Tennessee, have gross sales of less than $2,500 annually. About 8 percent of the farms in Wayne County have gross sales of more than $10,000 each year.

More employment opportunities are needed in Cypress Creek Watershed. The unemployment rate in Lauderdale County is 5.1 percent 11/ and 5.5 percent in Wayne County. 12/

About 28 percent of the flood plains are in farms that require 1½ man-years or more of hired labor. The remaining 72 percent are in family farms that require less than 1½ man-years of hired labor. 12/

Many residents of the watershed supplement farm income by working in nearby factories, especially in the Quad-City area. A concerted effort in rural community development is needed to increase income and employment opportunities for local watershed residents.

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RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

There are neither federal, state, nor local land use plans, policies, and controls in the watershed, except the administration of Natchez Trace Parkway which was discussed earlier.

Flood Prevention, Erosion, and Sediment

Planned project measures will decrease the frequency of flooding significantly. Damages will be reduced by 75 percent. The total watershed acres flooded with and without the project for selected storms are as follows:

Frequency	Acres Flooded Without Project	Acres Flooded With Project
1-year	5,230	1,580
2-year	7,010	3,100
10-year	9,140	5,660
100-year	10,321	7,690

The frequency-elevation-discharges for with and without project conditions are shown below for various locations in the watershed as indicated.

Location - Cypress Creek approximately 1.5 miles above the confluence with Middle Cypress Creek

Frequency	Elevation Without Project	Peak Discharge Without Project	Elevation With Project	Peak Discharge With Project
1-year	525.6	2,150 cfs	524.4	1,250 cfs
2-year	526.2	3,240 cfs	524.9	1,790 cfs
10-year	527.1	6,410 cfs	526.0	3,070 cfs
100-year	528.1	12,190 cfs	526.7	5,260 cfs

Location - Cypress Creek approximately 0.6 mile above the confluence with Little Cypress Creek

Frequency	Elevation Without Project	Peak Discharge Without Project	Elevation With Project	Peak Discharge With Project
1-year	480.8	5,300 cfs	479.5	3,610 cfs
2-year	482.2	7,690 cfs	480.6	5,070 cfs
10-year	485.1	14,630 cfs	482.6	8,680 cfs
100-year	490.0	27,450 cfs	485.3	15,050 cfs

Location - Cypress Creek approximately 0.2 mile below the confluence with Little Cypress Creek

Frequency	Elevation Without Project	Peak Discharge Without Project	Elevation With Project	Peak Discharge With Project
1-year	473.7	7,430 cfs	471.9	4,480 cfs
2-year	475.0	10,570 cfs	472.9	6,280 cfs
10-year	477.5	19,520 cfs	474.9	10,480 cfs
100-year	480.8	35,740 cfs	477.0	17,800 cfs

Location - Middle Cypress Creek 1,500 feet downstream from Highway 157

Frequency	Elevation Without Project	Peak Discharge Without Project	Elevation With Project	Peak Discharge With Project
1-year	547.7	2,110 cfs	546.6	880 cfs
2-year	548.0	2,950 cfs	547.1	1,390 cfs
10-year	548.8	5,390 cfs	547.7	2,500 cfs
100-year	549.6	9,720 cfs	548.4	4,220 cfs

With the project installed, the average annual area flooded will be reduced 70 percent (weighted average). The percent reductions shown on the following page show large variations for the different reaches listed. These variations are due to the floodwater retarding structures providing a high degree of protection from flooding immediately below the structures.

The flood of March 15-16, 1973, which was about a 100-year frequency, resulted in flooding on about 10,000 acres. The planned structural measures would reduce the number of acres flooded by this storm to about 7,700 acres. The protection afforded by the structural measures would eliminate much of the damages to fences, roads, bridges and buildings which resulted from this flood.

The present, future without project, and future with project land use in the flood plain is as follows:

Use	Present		Future w/o Project		Future w/Project	
	Acres	Percent	Acres	Percent	Acres	Percent
Cropland	3,261	31.6	4,046	39.2	4,436	43.0
Pastureland	4,590	44.5	3,805	36.9	4,017	38.9
Forest land	2,291	22.2	2,291	22.2	1,744	16.9
Idle	55	0.5	55	0.5	0	0.0
Miscellaneous	124	1.2	124	1.2	124	1.2
TOTAL	10,321	100.0	10,321	100.0	10,321	100.0

Average Annual Acres Flooded by Reaches
With and Without Project

Evaluation Reach Number *	Average Annual Acres Flooded		Percent Reduction
	Without Project	With Project	
I	189	64	66
II	414	185	55
III	601	195	68
IV	15	0	100
V	1,443	198	86
VI	251	9	96
VII	2,238	561	75
VIII	489	34	93
IX	922	156	83
X	111	0	100
XI	603	159	74
XII	139	139	0
XIII	887	372	58
XIV	756	244	68
XV	308	155	50
XVI	389	58	85
XVII	219	67	69
XVIII	588	357	39
XIX	1,555	845	46
XX	412	42	90
XXI	194	16	92
XXII	277	103	63
XXIII	162	9	94
XXIV	127	26	80
XV	630	140	78
XXVI	236	102	57
TOTAL	14,155	4,236	70

* See appendix C for Reach location.

Future with project condition projects a decrease of 55 acres of idle and 547 acres of forest land with an increase of 390 acres of cropland, and 212 acres of pastureland. The changes in land use projected are expected to occur because of the flood protection from the small frequent floods which result in the most damages to crops grown in the flood plain.

With the flood protection afforded by the planned project crop yields will increase. Below are crop and pasture yields expected in the future.

Crop	Unit	Future Without Project*	Future With Project**
Corn	bushels	77	94
Cotton	pounds	630	825
Soybean	bushels	35	45
Pasture	Animal Unit Months	7	9

* Yields that are expected to occur about 20 years in the future with improved technological practices.

** Yields that are expected about 20 years in the future with improved technology and more intensive land use.

The reduction in flood hazard will allow landowners to utilize resources more efficiently. More intensive use of existing cropland and pasture-land will be realized on 7,851 acres. Five hundred and forty-seven acres of marginal forest land are expected to be converted to cropland and improved pasture. Presently there are 55 acres of unproductive land that was previously in agricultural production that was abandoned because of the flood hazard. This land will be restored to its former productivity with the project.

Installation of the 19 floodwater retarding structures will cover 521 acres with water and/or sediment. In addition, 2,125 acres within the flood pools will be subject to periodic flooding and will require a use compatible with such flooding. The present land use of these 2,646 acres is 993 acres of forest land and 1,653 acres of pasture and cropland. Income lost from forest land each year is estimated at $8.00 per acre and income lost from open land per year is estimated at $38.00 per acre. However, the full amount will not be lost on the 2,125 acres since this land will not be permanently inundated by water. There will be a partial loss in income on this land.

Land to construct the dams, spillways, and borrow areas will require 420 acres. Of this total 159 acres are forest land and 261 acres are pasture and row crops. The type forest land to be cleared is mainly lowland hardwoods. Some timber production will be lost by clearing. However, most timber production in the area is from yellow poplar, which is the least dominant species. The hardwoods provide den trees and travel lanes for squirrel, and provide habitat for rabbit, mink, muskrat, and raccoon. The loss of this forest land will have a minor effect on wildlife. The sediment pools and dams of the 19 floodwater retarding structures will inundate 10.2 miles of stream, one farm pond, and one rainbow trout raceway. As previously mentioned, water level control gates will be installed at seven of the floodwater retarding structures. This will help offset the loss of wildlife and waterfowl habitat.

Channel work will require clearing 60 acres of forest land which will remain open and be used for crops, pasture, and wildlife habitat after construction.

Project installation will require a commitment of 343 man-years of local labor to install project measures. Two and 3 tenths man-years of labor will be needed each year to operate and maintain project measures. Additional resources such as equipment, gas, oil, food, and concrete will be committed to project installation. The contractor's capital investment in equipment will be depreciated in value after being used for project installation.

The combined effect of the proposed conservation land treatment and floodwater retarding structures will reduce the amount of sediment deposited in Cypress Creek and its tributaries and the Tennessee River. Land treatment measures will reduce sheet erosion, and the floodwater retarding structures will provide for 5,762 acre feet of sediment storage (see table 3). Land treatment measures will reduce average sheet erosion rates from 5.6 tons per acre per year without the project to 5.1 tons per acre per year with the project. Critical erosion; gullies, borrow pits, and roadbanks, will be reduced by 95 percent from an average of 240 tons per acre per year to about 5 tons per acre per year. The water quality of the streams should improve with a decrease in sediment entering the streams.

Land use changes expected in the watershed as a result of the project installation are:

LAND USE	PRESENT (AC.)	FUTURE W/PROJECT (AC.)
Cropland	15,947	15,258
Pastureland	25,046	27,309
Forest land	84,992	83,418
Miscellaneous land*	9,375	9,375

* Roadsides, farmsteads, urban, and idle land.

The changes in land use shown above indicate an increase in pastureland and a decrease in forest land and cropland.

Flood plain scour (average annual acres damaged) will be reduced by 70 percent. About 5 percent of this reduction is due to conservation land treatment and 65 percent due to structural measures. These damages (monetary) will be reduced by 57 percent. About 5 percent of this reduction is due to conservation land treatment and 52 percent to structural measures.

The average annual sediment yield from the entire watershed will be reduced from 183,000 tons to 96,000 tons; a 47 percent reduction in

sediment. Conservation land treatment alone, on the area downstream from floodwater retarding structures, will account for 13 percent of the 87,000 tons of sediment reduction. A combination of conservation land treatment and sediment entrapment at floodwater retarding structures will account for the remaining 87 percent of the total sediment reduction. Average annual suspended sediment consentration will be reduced from 332 milligrams per liter without the project to 175 milligrams per liter with the project. Conservation land treatment accounts for 21 percent of the reduction in suspended sediment. Structural measures, and land treatment upstream from structures, cause 79 percent of the reduction in suspended sediment. Reduction in suspended sediment concentration will improve the water quality.

Structural measures will benefit 10,321 acres of land in the watershed.

The 320 landowners in the flood plains will receive greater benefits from the installation of the project due to flood protection. In addition the 35,000 people living in the watershed will benefit from reduced erosion, sedimentation, and increased aesthetic appeal of the area. The FRS should detract little, if any, from the aesthetic appeal of the streams in this watershed considering the fact that only one structure will be constructed on a perennial stream. Also the Quad-City area with a 1970 population of 85,000 will benefit from the expenditure of funds in the area for project installation. Construction materials purchased locally and locally hired labor spending their salaries in the area will have a positive effect on the amount of money in circulation. A general benefit is felt in the public sector due to the tax revenues generated by spending and re-spending part of the original dollar. In addition, structural measures will improve the stream for recreational activities such as canoeing.

Installation of the planned project will provide 75 percent protection against flooding or an average annual benefit of $226,200 to agriculture while nonagricultural flood damages will be reduced 74 percent or $36,400.

The floodwater retarding structures will affect both quantity and quality of stream flow. With the installation of these structures, sediment load will decrease providing higher quality water. The stream will have increased and prolonged base flow by gradual release of floodwater from floodwater retarding structure pools, by seepage from reservoirs, and by water temporarily stored in the flood plain alluvium by bank-full flows in the channels.

The stream is clogged with gravel in segments along the watercourse. These clogged segments will be cleaned out to improve the flow characteristics and capacity of the streams. This work will tend to restore

the stream to its natural condition as suggested in the study of potential for wild, scenic, and recreation rivers in Alabama. 1/ However, the project will have very little effect on dry-season streamflow and cannot be expected to return the stream to the same condition that would result from a primeval forested watershed.

Ground water recharge will be increased by about 5 percent because of the conservation land treatment program and floodwater retarding structures. This will not result in a significant rise in ground water levels since ground water is, under present conditions, continually discharging into the stream system.

Analysis of similar channel work of the type proposed for Cypress Creek indicates that the water table will be altered where the water level in the channel is changed. However, the effect is significant only a few feet from the channel banks. Cypress Creek channel is being deepened only slightly; therefore, the water table will be lowered a few inches within a narrow band alongside the reworked channel.

Chemical pesticides escape into the environment by movement of water, soil erosion, drift, volatilization, and through plant and animal removal. 2/ The small reduction of total watershed cropland, with the planned project implemented, should result in a slight reduction in pesticide use. The installation of conservation practices that reduce soil erosion and runoff water will have a significant effect on reducing the loss of agricultural chemicals from fields. 3/ 4/ 5/

Annual sediment accumulation in Pickwick Reservoir, on the Tennessee River from Cypress Creek, will be reduced by 78 acre feet per year (87,000 tons). The aesthetic appeal of the streams in the watershed will be improved by reduction in sediment load. The Florence water supply system will benefit from reduced sediment.

Conservation land treatment will have a pronounced effect on the aesthetics of the watershed. Establishing vegetation on 60 acres of critically eroded roadbanks, gullies, and borrow pits will result in a more pleasing environment for the people who live in and visit the area. The installation of conservation land treatment practices on upland soils will result in lines, forms, and patterns that are more harmonious with the natural landscape.

Structural measures planned for the watershed will not have a significant impact on the plant communities of the area. 6/ Vegetation along the edges of permanent pools is likely to change to marsh-like conditions with a high composition of water-tolerant plants. This will be more pronounced in the upstream portion of the pool areas. The plant communities in the flood storage areas may change to a slightly higher composition of water-tolerant plants.

Only slight changes in plant communities are expected as a result of channel work. Creek banks that are disturbed will be planted to forage plants. Studies of other modified channels in North Alabama indicate that rice cutgrass (leersia oryzoides), low panicums (Panicum spp.), and knotgrass (Paspalum distichum) often become established near the normal water line. 7/ Willows (Salix spp.) and other water tolerant woody plants often become established on the channel side slopes. No species changes are expected on the undisturbed areas of the flood plain except for the acreage that will change from forest land, pasture, and idle land to cropland. The level of protection provided will not significantly affect growth of water tolerant trees in the flood plain.

Water Supply

The water supply intake for Florence is located about 8 miles downstream from the nearest bedload removal work. Because of this distance and the type of non-plastic material that is being removed, suspended load should be settled out. Even if all the suspended load is not settled out the turbidity caused by bedload removal at the water supply intake would be less than that caused by a small rain. Bedload removal will be done for about 10 hours per day, leaving 14 hours per day with no disturbance. After the total project is installed the sediment load at the water intake will be reduced by about 47 percent. The dams upstream from where channel work is planned will be installed prior to channel construction. These dams will eliminate a good portion of the sediment that would normally be moving downstream.

Installation of 19 floodwater retarding structures will initially impound 521 acres of water. This water can be used for watering livestock, fish production, and wildlife habitat. There is no water supply planned for industrial or municipal use.

Rural domestic water supplies in Cypress Creek Watershed are almost without exception from upland wells or flowing springs that receive water from upland recharge. Shallow flood plain wells are the only ones which might be affected by small local water table change. Overall, ground water recharge is expected to increase because infiltration and water holding capacity will be improved by conservation land treatment and cropping systems.

Fish and Wildlife

The impact of floodwater retarding structures on the immediate area will result from the clearing of existing vegetation in the flood pool and the inundation of 10.2 miles of streams.

Forest land is expected to decrease by about 1,500 acres, of which 536 acres is located in the flood plain. The loss of forest land will result in reduced habitat for some species of wildlife; however, other species that require open land will be benefited. It should be noted, however, that forest land in the watershed is expected to decrease without the project. All but one of the 19 structures will be located on intermittent streams. These floodwater retarding structures will, to some extent, reduce the potential breeding habitat for some andramous fish such as sauger or white bass. There will be no significant impact of the floodwater retarding structures on the utilization of these species for fishing. Fishing presently occures downstream from the proposed impoundment sites. The inundation of these intermittent streams will destroy habitat of some mollusks, small fish, amphibians and other wildlife.

Several fish classified as "threatened, endangered, or special concern" will be affected by the project:

Rare-1. Special Concern. Etheostoma blennius (Blenny darter) This fish is endemic to Alabama and Tennessee. Yokley states that this darter is not common in any part of the drainage, but occurs in all the large streams. 6/

Another study conducted by Boschung, University of Alabama, found this darter to be fairly common in Cypress and Shoal Creeks. 8/ Both studies indicated that this species would be harmed or extirpated in areas slated for channel work.

Boschung further stated that this species would be extirpated by impoundments. The distribution of the blenny darter in the area is presented in Boschung's report. The blenny darter is on the federal list of Rare and Endangered Fish and Wildlife of the United States as "Special Concern". Boschung states that this is one of the most vulnerable species in the project area. He found this darter at six localities. This fish exists on Cypress Creek where bedload removal is planned and on Threet Creek where new channel excavation is scheduled. Floodwater Retarding Structure No. 20, on Little Cypress Creek will inundate a large stretch of blenny darter habitat.

Rare-2. Special Concern. Phoxinus erythrogaster (Southern redbelly dace) Studies by Boschung and Yokley found this fish in springs, spring-fed streams and other small headwater streams. Yokley states that this species is most abundant in Burcham Creek and North Fork Branch. Any stream modification resulting in an increase of the water temperature will adversely affect this fish. This species is also intolerant to high silt concentration and inundation. Boschung states that this fish has a small range and will be extirpated in streams slated for excavation and inundation.

Rare-2. Special Concern. Notropis coccogenis (Warpaint shiner) Boschung's studies show that this shiner occupies much of the drainage area. Yokley states that even though this species is intolerant to silt, bedload removal, if done with care, would have only moderate adverse effects. Also, he states that this fish would not be adversely affected by impoundments. Boschung's report states, "Any modification of Cypress Creek that will increase siltation will have an adverse affect on Notropis coccogenis".

Threatened - Etheostoma boschungi (Slackwater darter) Boschung, who described this fish, states that it is known in Alabama only from the Cypress Creek Watershed and from three localities in the Flint River drainage. In Tennessee, this darter is known from the upper parts of Cypress and Middle Cypress Creeks and from one locality in the Buffalo River. Boschung did not find this species in the Little Cypress Creek drainage.

Yokley found the slackwater darter most abundant in Lindsey Creek and North Fork Branch. A few specimens were also collected in Middle Cypress and Burcham Creeks. Boschung indicated that this may be the most restricted species in the Cypress Creek Watershed and would be jeopardized in streams slated for channel work such as cleaning of the stream channel, streambank clearing and shaping and removal of detritus and inundation. This fish apparently breeds during the winter months. Planned features will be included in the final plans and specifications for the channel work to preserve and/or mitigate the loss of slackwater darter habitat.

The following seven fish classified as "Special Concern", would be adversely affected by the proposed project:

Hemitremia flammea - (Flame chub)
Notropis telescopus (Telescope shiner)
Notropis fumeus (Ribbon shiner)
Rhinicthys atratulus (Blacknose dace)
Noturus exilis (Slender madtom)
Etheostoma jessiae (Blueside darter)
*Lagochila lacera (Harelip sucker)

*The Harelip sucker is probably extinct.

Species of wider but relatively smaller ranges that would be subject to extirpation in stream areas to be excavated or inundated are Etheostoma jessiae, Etheostoma rufilineatam, Phoxinus erythrogaster, and Hemitremia flammea.

Boschung found that Little Cypress Creek, especially the portion from the Alabama-Tennessee border to Sharp's Mill Reservoir, provides

excellent habitat for the following darters: Etheostoma blennius, E. blennioides, E. caeruleum, E. jessiae, E. rufilineatum, E. simoterum, and E. zonale. Structure Site No. 20 will inundate a large portion of excellent darter habitat as well as that of the rock bass, Ambloplites repestris, an excellent game fish.

Additional information concerning the abundance, distribution, and ecology of these fish is available in studies conducted by Yokley and Boschung.

The planned project will also affect fish other than "threatened" or "endangered" species. Some of these effects such as reduction in silt, after installation of the project, will be beneficial to the stream fishery. Where channels are completely filled with gravel and debris, channel work will create habitat. Although not designed specifically for fish production, the floodwater retarding reservoirs will create some fish habitat, and impoundment fishery will be increased.

One detrimental effect of stream alteration is the loss in stream length. The planned channel work on Threet Creek and North Fork Creek will divert water from two miles of existing channels. Another adverse effect is the loss of streamside vegetation, cover and shelter for fish. The food supply of some macroinvertebrates will be altered by streambank alteration. About 15 or 16 miles of perennial streams will be altered by impoundments or channel work. Streambank vegetation along the length of channel will be modified to varying degrees. However, only 50-60 percent of the riparian vegetation should be disturbed in work areas. Again, the planned project of bedload removal and clearing and shaping will minimize this effect.

Alteration of an unstable substrate has caused increased sedimentation and siltation on other projects, but the nature of the Cypress Creek channel bottom is such that it will remain stable. Temporary increased sedimentation and siltation caused by construction can be detrimental to the aquatic environment. Other detrimental effects such as increased streambank erosion due to loss of streamside vegetation, loss of basic food material due to loss of streamside vegetation, loss of the aesthetic value of the stream, etc., will be minimal in the planned project because of the use of bedload removal and a minimum of clearing and shaping.

Stream water temperatures are expected to increase slightly in impoundments and immediately downstream due to removal of streamside vegetation and exposure of more water to solar radiation for longer periods. Channel work will only require a minimum amount of stream canopy removal. Eleven structures will have cool water outlets several feet below the water surface. Water temperatures in the stream vary from about 35 degrees in the winter to 80 degrees Fahrenheit in the summer. 11/

Boschung concluded after an intensive study of the Cypress Creek Watershed, that fish habitat will be destroyed as a result of the planned project. The impact of the project will also "reduce certain fish populations making them more susceptible to extirpation and decimation. We do not know of a single species of fish that will be totally eliminated from the watershed as a result of the Soil Conservation Service watershed project; however, conditions of some will be worsened."

There are no rare or endangered amphibians or reptiles in the project area. 6/ 8/ One salamander, Cryptobranchus alleganiensis alleganiensis (Hellbender), classified as "status undetermined" by the Alabama Department of Conservation and Natural Resources may be in the drainage area. Assessments of the fauna in the Cypress Creek project area by Boschung and Yokley did not include an actual collection of the hellbender, but both investigators agree that this salamander could be there. The hellbender is found in Alabama only in the Tennessee River drainage, in rocky tributaries of the river. This salamander is extremely secretive in daily and seasonal activities, and is hard to observe or collect. Yokley states that only the lower portions of Cypress Creek provide ideal habitat so that floodwater retarding structures will probably have little effect on these animals. However, both Yokley and Boschung believe that channel work will destroy the habitat of the hellbender at those sites affected. Yokley predicts that the hellbender could possibly benefit from the project after installation, due to decreased silt conditions.

Mammals, birds, reptiles, and amphibians in the drainage should not be adversely affected by the alterations proposed for flood control," according to Yokley. This report also stated the possibility of some aquatic birds and frogs being benefited by the project. Freshwater mussels will have parts of their habitat destroyed by bedload removal below Sharp's Mill Dam in Little Cypress Creek. Reduction of silt will benefit mussels after the project is installed.

Yokley concluded that the project should have minimal adverse effects and will improve water quality.

Boschung also concluded that the proposed project would have little effect on herptiles with the possible exception of the hellbender. This study also stated that few of the mammals in this area are dependent on permanent bodies of water, but some are and may be affected by the project. Those affected depend to some extent on shellfish for food. The application of 170 acres of wildlife upland habitat management will have a beneficial effect on wildlife. Other land treatment practices such as field borders, grassed waterways, conservation cropping systems, and ponds will improve wildlife habitat.

Some biological control on mosquitoes can be expected from aquatic organisms and avifauna. In addition, FRS are remotely located in relation to human populations so as to minimize undesirable impacts from mosquito problems. Aquatic plant growth will be discouraged in shallow areas by deepening the water line.

The average annual storm will not create flood pools for more than 2 or 3 days. Furthermore, this prevents downstream flooding over a much larger area. The net results of the FRS would be to reduce the favorable mosquito breeding habitat that is dependent on temporary floodwaters.

Archaeological, Historical, and Scientific

To determine the effects of the planned project on sites of archaeological and historical significance, an archaeological survey was conducted. A total of 59 sites were located within the Cypress Creek drainage area with 10 of these sites being located in areas which may be disturbed by the proposed structural measures. Six of these sites are located within the areas to be inundated by the floodwater retarding structures. Floodwater Retarding Structure No. 1 will inundate two campsites. Structures Nos. 15 and 18 will each inundate one campsite and Structure No. 20 will inundate one campsite and one bluff shelter. Four sites along streams designated for channel work will be disturbed. One site is on Cypress Creek, two on Middle Cypress, and one is on North Fork Creek. No historical or archaeological sites eligible for nomination to the National Register of Historic places were found in the watershed.

Economic and Social

The project will serve as a stimulus to the economy by providing new employment opportunities. About 325 new semi-skilled and 18 skilled jobs will be created during the 10-year installation period. Each year thereafter 2.3 man-years of employment will be needed to operate and maintain the project. Operation and maintenance of the project will have a continuing favorable effect on the local economy.

Additional income will be received by the laborers employed during construction and by farmers from the increased sales of farm products as a result of damage reduction and agricultural enhancement. The increased purchase of items or services required to produce and market the expanded production represents new income to local farm supply dealers, transporters, and processors.

The new income will generate additional consumer expenditures for basic necessities, items which improve their standard of living, and

other goods and services. These expenditures will initiate a chain of spending whereby each successive recipient spends a portion of the amount received. Business activity in other sectors of the local economy and region will increase as this new income is spent and respent. Also, more employment opportunities will be provided in these sectors.

Loss of agricultural production in the sediment pools will result in a loss of income.

Application of land treatment measures will increase opportunities for watershed residents. Land adequately treated will result in increased yields requiring more hired labor to produce and harvest the added production. Increased yeilds result in more income, some of which will be spent at retail outlets. Added expenditures will require added sales personnel.

Employment opportunities will be increased during the treatment of critical areas. For example: the shaping of critical roadbank areas will provide employment for heavy equipment operators. About 650 hours of operator time valued at $3,250, will be required to shape roadbank gullies. In addition, an estimated 2,275 hours of employment, valued at $6,800, will be created by land preparation, vegetation, mulching, fertilization, and shaping of these areas.

Conservation land treatment in conjunction with the structural measure program will reduce flooding. Reduced flooding of roads will enable workers to get to work on time, buses to pick up school children, and mail to be delivered as scheduled.

Reduced flooding will result in increased income for watershed residents by allowing for more efficient use of available land resources. For example, the application of a conservation cropping system increases production by rotating crops in combination with cultural and management measures. This system does not deplete the soil of essential nutrients as does planting the same crop year after year.

The improved economic climate will enable the community to better support new or improved schools, parks, roads, health facilities, and other public projects that will add to the enjoyment of life.

The project will affect the local agricultural economy by increasing income in four ways: (1) reducing the likelihood of having to replant or plant late, (2) reducing crop losses from floods, (3) enabling farmers to produce higher yields and a better quality crop, and (4) improving the conditions for harvesting crops. Soybeans and corn are important crops in the watershed which require planting at the proper time to obtain maximum yields. Ryder concluded that, "soybean

yields can decline nearly 3 bushels per acre for each 10-day delay in planting after the first of May. Corn yields decline more than soybeans when planted after May 15." 12/

Reduced flooding will help increase the per capita income of watershed residents. The latest per capita income (1971) for watershed residents was $2,681. According to past trends, per capita income has been increasing about 6 percent per year. This increase can be expected to be higher except in years when general economic conditions are unfavorable. The project should have minimum effects on supplemental farm enterprises such as recreation and wood products on marginal agricultural land.

Knowledge of the protection afforded by the project will give residents a greater sense of economic security. Families can offer their children greater incentives to continue their education and remain in the community. The family farm pattern of agriculture will be strengthened which will help maintain population stability.

Some social economic adjustments will be required. Two farming operations, one business, and five dwellings will be displaced by project installation. There will be 12 persons displaced from the 5 dwellings. The impact of these adjustments will be minimized with help from the local sponsors. A comparable replacement dwelling giving full consideration to the desires and needs of the family involved should make the adjustments minor and the period of adjustment short.

The scenic and aesthetic well being of the watershed residents will be affected by the application of 7,000 feet or 5 acres of vegetation along field borders. This vegetation will also provide food and shelter for birds and animals in the watershed. This will increase hunting opportunities for local residents which will improve their quality of life.

The project will contribute to the economic goals of the Tennessee Valley Authority and the Appalachian Regional Development Act of 1965. The project will have a favorable impact on the economic growth and rural development in the region.

The Natchez Trace Parkway contains 17.5 miles of scenic highway within the watershed and is reserved for use by the public. The project will not affect this area.

Rural-residential developments are presently being developed adjacent to planned structures sites 20 and 21. Reservoirs created by the floodwater retarding structures will enhance the area at these sites. A

public water supply is available to these developments. These developments were in progress when the proposed structures were planned and all enhanced land values are incidental to the project.

Local secondary benefits will accrue in the watershed and surrounding area as a result of the project. The increase in agricultural production will result in a greater demand for agricultural machinery, equipment, and supplies. The additional income of the landowners will have a multiplier effect in the area. Increased profits by local industries will increase the demand for transportation, processing, and marketing of the increased production.

Application of the planned forest land treatment and management measures will reduce erosion, runoff, and sediment problems. Well-managed forests will enhance recreation, wildlife habitat, timber production values, and water quality.

The forest and wildlife resources will be benefited by a more efficient use of forest management techniques to enhance the value of forest products and availability of wildlife food in the area.

Tree planting on 2,000 acres of unproductive land will be brought back into production and in turn enhance the economy of the watershed area.

The relocations will affect the environment by causing five houses to be moved or raised to new locations. In general, the conditions of the new housing for displaced persons will be comparable or better than the present housing, thereby improving the environment for these displaced persons. The installation of structure 21 will cover with water a 5-acre catfish pond and one rainbow trout raceway. These improvements will be re-established. Installation of site No. 13 will involve moving one hog operation to a new location. This will mean that new land will be covered by the holding pens and feeding barns which will be constructed at a new location.

Open land resulting from project installation of the channel can be used for agricultural purposes if the landowner so desires. This land will be best suited for pasture or wildlife plantings.

Favorable Environmental Impacts

1. Reduce erosion on the uplands by 10 percent annually.
2. Maintain and improve the productivity and tilth of the soil.
3. Reduce the average annual area flooded by 70 percent.
4. Conservation land treatment on 21,920 acres of agricultural land will adequately protect the land and enable it to be used according to its capabilities.

5. Reduce the possibility of fertilizer nutrients and pesticides transported by streams by the application of conservation land treatment and by reducing flooding.
6. Reduce the sediment load carried out of the watershed from 183,000 ons to 96,000 tons annually, a 48 percent reduction.
7. Average suspended sediment concentration will be reduced each year from 332 milligrams per liter to 175 milligrams per liter.
8. Reduce surface runoff by 5 percent by the application of conservaion land treatment measures, thus increasing ground water recharge.
9. Reduce sediment deposition on the flood plains by 70 percent.
10. Treatment of critically eroding roadsides and other steep, bare areas will result in 60 percent less aggradation of streams.
11. Conservation land treatment of the upland will result in a more pleasing appearance of the landscape.
12. Reduce flood plain crop and pasture damages by 75 percent.
13. Reduce other agricultural damages on the flood plain by 75 percent.
14. Reduce road and bridge damages by 74 percent.
15. Reduce flood plain scour damage by 52 percent.
16. Reduce indirect damages by 80 percent.
17. Channel work will improve fish corridors and travel ways through areas that are now clogged with gravel and debris.
18. The stream fishery will be improved by the reduction in suspended sediment concentration and by reduction in channel aggradation.
19. Fresh water mussel habitat downstream from site No. 20 will be improved by reduction in suspended sediment concentration.
20. Warm-water lake habitat will be increased by the addition of 521 acres of water impounded by 19 floodwater retarding structures. Additional lake habitat will be provided by the 78 ponds proposed in conservation land treatment.
21. Result in greater agricultural efficiency and income stability for farmers in the area and strengthen and expand the local economy by about $284,400 annually.
22. Create the need for approximately 2.3 man-years of employment to operate and maintain the planned project.
23. Create approximately 343 new jobs during the installation of the structural measures.

Adverse Environmental Effects

1. Project construction will restrict the future land use of 3,472 acres of land needed to install and operate the structural measures.
2. A total of 10.2 miles of streams of which 1.8 miles is perennial will be covered by floodwater retarding structures and reservoirs.
3. Floodwater pools will intermittently inundate 2,125 acres (1,340 acres cropland and pastureland and 785 acres forest land).

4. Require destroying all vegetation on the 420 acres needed for dams and emergency spillways during construction. Much of the re-established vegetation will not be the same type that is now growing. There will be a permanent loss of all vegetation on 521 acres needed for the sediment pools.
5. Result in displacement of the residents of five dwellings.
6. Result in displacement of two farming operations.
7. Result in displacement of one business.
8. Wildlife habitat will be altered where structural work requires disturbance of existing vegetation. The new habitat will result in reduction of wildlife requiring the habitat destroyed but an increase in population of wildlife dependent on the new habitat.
9. Sediment and stream turbidity will be temporarily increased during construction of the 14.4 miles of channel work.
10. Floodwater retarding structures will inundate 1.8 miles of perennial stream and channel work on 14.4 miles of stream will destroy some habitat for several species of fish, especially those that inhabit springs and spring-fed branches.
11. Bedload removal and other channel work will have temporary adverse effects on the habitat of at least one amphibian species and several species of mollusks.
12. At least two fish now classified as endangered/threatened and four or more fish listed as special concern will be adversely affected by channel alteration and stream inundation.
13. There will be a loss of riparian vegetation associated with channel work. This will have direct and indirect adverse impacts on the aquatic ecosystem as well as the plant and animals requiring stream-bank habitat, by removal of shelter, food supply and travel lanes.

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ALTERNATIVES

The alternatives to the proposed project that were considered are:

(1) Accelerated Conservation Land Treatment Measures.
(2) Accelerated Conservation Land Treatment and Flood Plain Zoning.
(3) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, and Flowage Easements.
(4) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, and 50.3 Miles of Channel Excavation.
(5) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, 11 Miles of Channel Excavation, and 45 Miles of Channel Clearing and Shaping.
(6) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, 11 Miles of Channel Excavation, and 7 Miles of Channel Clearing and Shaping.
(7) No Project.

The alternatives are described as follows:

(1) Accelerated Conservation Land Treatment Alone

This alternative consists of applying conservation land treatment measures and critical area treatment as proposed in the project action measures. These measures would be applied and financed by the local landowners with technical assistance being provided by the Soil Conservation Service and the Forest Service.

The alternative would reduce flood damges by an estimated four percent or by $9,500 annually. Sheet erosion and sediment yield would be reduced by an estimated 10 percent. Stream channel aggradation would be reduced by 60 percent, and suspended sediment would be reduced from 332 mg/1 to 299 mg/1. Other impacts of land treatment are described in the "Environmental Impact" section. Flood damage reduction would not be sufficient to allow for land use changes or more intensive farming in the flood plain.

The favorable and adverse impacts that would be caused by installation of the structural measures would be foregone. The estimated cost of this alternative is $1,388,700.

(2) Accelerated Conservation Land Treatment Measures and Flood Plain Zoning

Conservation land treatment measures, would be the same as in the proposed action. The implementation of flood plain zoning would offer no further

relief to agricultural damages. Flood and sediment damages would continue unchanged. Flood plain zoning would, however, regulate future land use by restricting developments in areas subject to these damages. The estimated total cost of this alternative is $1,595,100.

(3) Accelerated Conservation Land Treatment and 19 Floodwater Retarding Structures

Location of the 19 floodwater retarding structures would be the same as in the proposed project. Conservation land treatment consists of applying land treatment and critical area treatment as in the proposed project.

The floodwater retarding structures would temporarily store the runoff from about 50 percent of the drainage area above the confluence of Cox Creek and Cypress Creek. This alternative would reduce peak flood flows downstream providing for an overall reduction of 59 percent in average annual acres flooded. Floodwater retarding structure impoundments would provide added fishery habitat for the watershed.

Prolonged flooding due to insufficient channel capacities to carry the low stage release rates of the structures would be experienced on about 3,220 acres. Land use changes to less productive uses that could with stand prolonged flooding would be needed. These changes to a lower value production unit would reduce income, lower land values, and probably force some marginal farmers out of business. Prolonged flooding on the 3,220 acres would not allow intensification of farming or any changed land uses to a higher value. In affect this alternative would induce damages on about 30 percent of the flood plain due to prolonged flooding.

Land required for installation of this alternative would be 2,125 acres for floodwater detention pools. Dams, spillways and borrow areas would require 420 acres. Of these totals 367 acres of forest land would require clearing which is an adverse affect on wildlife habitat. The sponsors would have to obtain flowage easements on the 3,220 acres subject to prolonged flooding.

This alternative would cost an estimated $8,967,400. This consists of $1,388,700 for land treatment, $6,934,900 for floodwater retarding structures and $643,800 for flowage easements.

(4) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, and 50.3 Miles of Channel Excavation

Conservation land treatment and location of the 19 floodwater retarding structures would be the same as in the proposed actions.

The 50.3 miles of channel excavation consists of: Cypress Creek from its junction with Little Cypress upstream to the Natchez Trace Parkway; Middle Cypress Creek from its junction with Cypress Creek upstream through Alabama and about one mile into Tennessee; Burcham, Lindsey, Threet, and North Fork Creeks from their junctions with Cypress Creek upstream to the Natchez Trace Parkway; Bruton Branch from the parkway downstream to Burcham Creek; Dulin Branch from its junction with Cypress Creek upstream to Alabama Highway 157; the lower one mile of Spring Branch; and four reaches averaging about 1½ miles each along Little Cypress Creek. The reaches on Little Cypress are located near; junction with Cypress Creek, Alabama Highway 157, Zip City, and Alabama/Tennessee state line.

These measures would result in an 84 percent reduction in flood damages and an average annual sediment reduction of 47 percent at the mouth of the watershed. Damages to fish and wildlife habitat would occur as a result of channel excavation through removal of trees along the streambanks, increased water temperature, increased sediment and turbidity during and immediately following construction, and by destruction of pools and riffle areas in the channel bottom.

The construction of alternative 4 would require acquisition of land rights on 4,206 acres. One thousand nine hundred and forty-six acres of this total are forest land, of which 1,137 acres would be cleared for construction of channels and floodwater retarding structures. This clearing would affect the wildlife dependent upon forest land for cover, food, and travel lanes. The remaining forest land in the detention pools would receive periodic flooding. The 420 acres required for the dams, spillways, and borrow areas would be lost for crop production. However, the borrow areas could be used for pasture, forest land, and wildlife habitat. The 308 acres occupied by the proposed new channel would be lost for any future production. A travel way for maintenance and inspection would require 242 acres, which could be used for pasture, crops, and/or wildlife habitat.

This alternative would cost an estimated $10,270,800. This consists of $1,388,700 for land treatment, $6,934,900 for floodwater retarding structures, and $1,947,200 for channel work.

(5) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, 11 Miles of Channel Excavation, and 45 Miles of Channel Clearing and Shaping

Conservation land treatment and location of the 19 floodwater retarding structures would be the same as in the proposed action.

The 11 miles of channel excavation and 45 miles of channel clearing and shaping (total 56 miles) would be along the same reaches of streams as described in Alternative (4) for the 50.3 miles. The increased length is due to clearing and shaping work following the existing channel alignment whereas channel excavation work involves major re-alignment.

Channel clearing and shaping, and new channel excavation for this alternate would be performed in the same manner as described in the planned project.

This alternative would provide 77 percent reduction in flood damages. The 11 miles of channel excavation would cause damage to fish and wildlife habitat. This damage would be of the same nature as that of Alternative 4. Land use changes associated with structures and channel work were not calculated, but they would be about the same as those of Alternative 4. This alternative would cost an estimated $9,620,400. This consists of $1,388,700 for land treatment, $6,934,900 for floodwater retarding structures and $1,296,800 for channel work.

(6) Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, 11 Miles of Channel Excavation, and 7 Miles of Clearing and Shaping

Conservation land treatment and location of the 19 floodwater retarding structures would be the same as in the proposed action.

The 11 miles of channel excavation consists of: portions of Cypress Creek in the vicinity of Cypress Inn, Salen Church and Cloverdale; the lower ¼ mile of Threet and North Fork Creeks and Dulin and Latham Branches; one mile of Little Cypress above Alabama Highway 157; and Middle Cypress between Bethel Berry and Bethel Grove Churches. The 7 miles of clearing and shaping would involve: about 2 miles of the lower portion of Burcham Creek; one mile of Cypress Creek near Wesley Chapel; one mile each of Middle Cypress Creek and Springs Branch near Cloverdale; and ½ mile of Little Cypress Creek below Alabama Highway 157.

This alternative would reduce average annual flood damages by about 74 percent. Fish and wildlife habitat along the stream would be damaged by the removal of trees along the channel banks, increased sediment and turbidity during and immediately following construction, and by destruction of pools and riffle areas in the channel bottom.

Forest land cleared for construction of dams and channels would be lost for wildlife travel lanes, food source, and cover. The permanent pools of the dams would provide additional habitat for fish. Land use changes

associated with structures and channel work were not calculated, but they would be about the same as those of Alternative 4. This alternative would cost an estimated $8,885,600. This consists of $1,388,700 for land treatment $6,934,900 for floodwater retarding structures and $562,000 for channel work.

(7) No Project

This would limit the application of land treatment measures to the present on-going program. The present rate of conservation planning for land treatment is approximately 22 percent of the total amount proposed in the other alternatives.

Flooding would continue, resulting in floodwater and erosion damages.

The deterioration of the cultivated flood plain soils by scour would continue until the cumulative effect of this damage forced land use conversion to less productive uses.

The need to use 3,472 acres of land to construct the structural measures and the resultant impacts would be eliminated.

The creation of 521 acres of surface water which could be used for fish and wildlife will be foregone.

The need to modify 14.4 miles of stream channel and the resultant impacts would be eliminated.

SHORT-TERM VS. LONG-TERM USE OF RESOURCES

Trends in Cypress Creek Watershed indicate future land use will be agricultural with some rural-residential development. The rural-residential development is not expected to take place in the flood plain but rather on the uplands of the watershed. Floog plain land is expected to remain in agricultural production.

This project is expected to be compatible with long-term uses of land, water, and other natural resources and with current and expected future uses both within the watershed and the two counties. Implementation of the proposed project should not preclude any options available for long-term use of the area. It is expected to remain effective in conserving land, water, and wildlife resources beyond its design life of 100 years.

The watershed is within the Tennessee-Elk Subarea of the Tennessee Water Resource Region. There are 14 PL-566 projects (installed, approved, or potential) in the subarea but only two of the 14, Cypress and Spring Creeks, are tributaries to the portion of the Tennessee River below Wilson Dam. This part of the river is the only part of the region that will be measurably affected.

Cypress Creek Watershed and Spring Creek Watershed (proposed project--Colbert County, Alabama) together comprise about one percent of the drainage area of the Tennessee River at Tuscumbia. Since the Spring Creek Project is in the early stages of formulation, the cumulative affects of the projects are unknown. However, the qualitative affects of the two projects will be similar and are described in the following paragraphs.

Reduction in sediment and turbidity in Pickwick Reservoir will be extensive. Wilson Dam, on the Tennessee River, traps all heavy sediment (sand and gravel bedload) and nearly all suspended sediment (silt and clay) that would normally be transported through the reach by the Tennessee River. This means that Cypress and Spring Creeks are major sediment sources in the reach below Wilson Dam.

Reduction in sediment discharged into the Tennessee River will result in a reduction in the amount of gravel available for dredging in this part of the river. The gravel being dredged from the river is not entirely from Cypress and Spring Creeks. Some of it accumulated in the river bed before construction of Wilson Dam, but resupply is from the creeks and the amount available will decline at a rate dictated by the balance between dredging and resupply.

Secondary effects of reduction in gravel deposition may be expected in proportion to the reduction in dredging. Local sedimentation and turbidity caused by stirring the bottom during dredging will be reduced or eliminated and navigation hazards caused by dredges keeping station in the channel will be reduced or eliminated as dredging operations decrease. If dredging increases, reverse conditions would prevail. Present gravel accumulations do not present hazards to navigation so reduction in gravel deposition will not be significant to navigation.

Reduction in silt and clay sized sediment will result in decreased turbidity and therefore, lowered water treatment costs, lowered maintenance costs through reduced wear and erosion of power generating equipment, and increased fish, wildlife, and aesthetic values of Pickwick Reservoir.

Clearer water may result in a change in aquatic habitat with possible increase in water-weed growth and resultant decline of fishery resources. The estimated physical amount of average annual sediment reduction expected as a result of the Cypress Creek Watershed Project has been presented in the Environmental Impact section.

Waterflow control afforded by the two watershed projects will be of minor importance because of the large size of the river and the fact that it is already controlled by mainstream dams.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS

Installation of the 19 floodwater retarding structures will cover 521 acres with water and/or sediment. In addition, 2,125 acres within the flood pools will be subject to periodic flooding and will require a use compatible with such flooding. The present land use of these 2,646 acres is 993 acres of forest land and 1,653 acres of pasture and row crops.

Land to construct the dams, spillways, and borrow areas will require 420 acres. Of this total, 159 acres are forest land and 261 acres are pasture and row crops.

Three hundred and sixty-seven acres of forest will be removed for construction of the dams, sediment pools, and spillways. The type forest land to be cleared is mainly lowland hardwoods. Some timber production will be lost by clearing. However, most timber production in the area is from yellow poplar, which is the least dominant species. The hardwoods provide den trees and travel lanes for squirrel, and provide habitat for rabbit, mink, muskrat, and raccoon. The loss of this forest land will adversely affect wildlife.

The sediment pools and dams of the 19 floodwater retarding structures will inundate 10.2 miles of stream, one farm pond, and one rainbow trout raceway.

Channel work will require clearing 60 acres of forest land which will remain open and be used for crops, pasture, and wildlife habitat.

Project installation will require a commitment of 343 man-years of local labor to install project measures. Two and three tenths man-years of labor will be needed each year to operate and maintain project measures. Additional resources such as equipment, gas, oil, food, and concrete will be committed to project installation. The contractor's capital investment in equipment will be depreciated in value after being used for project installation.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

General

The application for assistance in solving problems related to land and water resources was made in 1961 by the Cypress Creek Watershed Conservancy District, Lauderdale County Soil and Water Conservation District, Wayne County Soil Conservation District, and the Lauderdale County Commission.

The State Soil and Water Conservation Committee gave this project a priority for planning, and a request for planning authorization was made to the Administrator of the Soil Conservation Service in May 1966. Planning authorization was granted in April 1967. Various federal and state agencies were notified immediately of this authorization and a request for their assistance in planning the project.

During the planning of the project, close cooperation was maintained with these agencies. Approximately 35 meetings were held with interested agencies, the sponsors, and local interest groups during the period of plan development. Alternatives suggested by organizations and individuals were considered in developing the plan.

On June 9, 1971, representatives of the Soil Conservation Service, U. S. Fish and Wildlife Service, and the Alabama Department of Conservation and Natural Resources made a joint field review of the lower reaches of Cypress Creek to consider alternatives to the proposed channel enlargement. Several floodway proposals were discussed. The group concluded that the existing depth of Cypress Creek was not sufficient to permit a floodway to function properly.

An informal field review of the tentative work plan was held on June 15, 1971, at the Lauderdale County Courthouse in Florence, Alabama. All concerned local, state, and federal agencies were invited to this meeting and asked to comment on the work plan. Agencies represented at the meeting were the Lauderdale County Soil and Water Conservation District, the Wayne County Soil Conservation District, the Cypress Creek Watershed Conservancy District, the U. S. Fish and Wildlife Service, the Alabama Department of Conservation and Natural Resources, the Alabama Forestry Commission, the U. S. Forest Service, and the Soil Conservation Service. In addition, several interested landowners and members of local sportsmen's organizations attended the review. During the meeting, a special opportunity was provided the U. S. Fish and Wildlife Service and the Alabama Department of Conservation and Natural Resources representatives to suggest alternative methods that would reduce adverse environmental effects expected from project installation.

A public meeting was held on July 14, 1971, in Cloverdale School, Cloverdale, Alabama. Major topics discussed were new guidelines for planning, and review of channel improvement, ("Guidelines for Planning and Review of Channel Improvement", SCS Watershed Memorandum 108, February 4, 1971) and environmental impact statements as required by the National Environmental Policy Act (NEPA) of 1969.

Because of significant changes in the proposed action brought about as a result of NEPA, a second public meeting was held on September 25, 1973. This meeting was attended by about 26 people representing agencies, groups and individuals. The project was explained and a question and answer session followed. There were questions from property owners who would be affected by the project, but no opposition was expressed.

On August 16, 1973, a meeting was held in Montgomery, Alabama with representatives of the U. S. Fish and Wildlife Service and the Alabama Department of Conservation and Natural Resources to further familiarize these agencies with the revised proposal.

A public meeting was held on March 25, 1975 in Florence to review the draft EIS and Work Plan. Notice of this meeting was published in the local newspaper for at least 15 days prior to the meeting. This meeting was in keeping with regulations of the Soil Conservation Service published in the Federal Register on June 3, 1974. In addition, 35 meetings have been held with interested agencies, sponsors and interest groups during plan development.

The National Register of Historic Places was reviewed. Project work will not alter any of the historic places listed in the register. In addition, the Alabama Historical Commission reviewed all their historic and architectural inventories and made an onsite inspection. They concluded that the construction of the Cypress Creek Watershed Project would not have any adverse affect on any historical sites and/or structures. No archaeological sites eligible for nomination to the historical register were found. The Tennessee Historical Commission, whose Executive Director is the State Historic Preservation Officer, reviewed the proposed project and does not have any objections.

The work plan and the environmental impact statement have been prepared considering all the comments and recommendations provided by the sponsors, state, and federal agencies, and concerned individuals and groups.

Discussion and Disposition of Each Comment on Draft EIS

The following agencies, groups, and individuals were asked to comment on the draft environmental impact statement:

COMMENTS REQUESTED	COMMENTS RECEIVED
Department of Agriculture	
Office of Equal Opportunity	
Department of the Army	
Chief of Engineers	X
Washington, D. C.	
Corps of Engineers	
Atlanta, Georgia	
Corps of Engineers	
Nashville, Tennessee	
Corps of Engineers (District)	X
Nashville, Tennessee	
Department of Commerce	
National Marine Fisheries Service	
Department of Health, Education, and Welfare	
Office of the Regional Director, Region IV	X
Food and Drug Administration	
Department of Housing and Urban Development	X
Department of the Interior	X
U. S. Bureau of Mines	
Pittsburg, Pennsylvania	
U. S. Bureau of Mines	
University, Alabama	
U. S. Fish and Wildlife Service	
Atlanta, Georgia	
U. S. Fish and Wildlife Service	
Decatur, Alabama	
Bureau of Outdoor Recreation	
National Park Service	
Office of Environmental Project Review	

COMMENTS REQUESTED	COMMENTS RECEIVED
Department of Transportation	
U. S. Coast Guard	X
Environmental Protection Agency	
Administrator Washington, D. C.	
Regional Administrator Atlanta, Georgia	X
Advisory Council on Historic Preservation	
Appalachian Regional Commission	
Federal Power Commission	
Office of Environmental Affairs	
Tennessee Valley Authority	
Director, Water Control Planning Knoxville, Tennessee	X
Office of Tributary Area Development Florence, Alabama	
Division of Agricultural Development Muscle Shoals, Alabama	X
Director of Environmental Planning Chattanooga, Tennessee	X
Governor of Alabama	
Attorney General of Alabama	X
Alabama Development Office	
Mr. R. C. Bamberg, Director of ADO	
Alabama Department of Conservation and Natural Resources	X
Alabama Historical Commission	X
State Health Department	
Alabama State Soil and Water Conservation Committee (Agency designated by Governor of Alabama)	X
Muscle Shoals Council of Local Governments	

COMMENTS REQUESTED	COMMENTS RECEIVED
Alabama Commissioner of Agriculture	
Alabama Cooperative Extension Service	
Alabama Cooperative Fishery Unit	
Alabama Department of Education	
Alabama Forestry Commission	
Alabama State Highway Department	X
Alabama Water Improvement Commission	
Geological Survey of Alabama	
Governor of Tennessee	
State of Tennessee Office of Urban and Federal Affairs (Agency designated by Governor)	
Tennessee Department of Agriculture	X
Tennessee Department of Conservation	X
Tennessee Department of Public Health	X
Tennessee Department of Transportation	
Tennessee Energy Office	
Tennessee Historical Commission	X
Tennessee Office of Economic and Community Development	
Tennessee State Planning Office	
Tennessee Wildlife Resources Agency	X
Tennessee State Soil Conservation Committee	
Agricultural Extension Service, University of Tennessee	
Agricultural Experiment Station, University of Tennessee	X
Economic Research Service, University of Georgia Experiment Station	
Alabama Association of Soil and Water Conservation Districts	
Tennessee Association of Conservation Districts	

COMMENTS REQUESTED	COMMENTS RECEIVED
Ladies Auxiliary, Alabama Association of Soil and Water Conservation Districts	
Alabama Archaeological Society	X
Alabama Sportsman Conservation Club	
Alabama Wildlife Federation Committee on Channelization Huntsville, Alabama Mr. Reo Kirkland, Executive Director Montgomery, Alabama	
The Alabama Conservancy Mrs. Lindsey C. Smith, President Birmingham, Alabama Mr. Daniel Payne Hale, President Huntsville, Alabama	
Department of Anthropology, University of Alabama	
Environmental Defense Fund, Washington, D. C.	
Environmental Impact Assessment Project, Washington, D. C.	
Friends of the Earth, Washington, D. C.	
National Audubon Society National Headquarters Washington, D. C. Central Midwest Representative Mauckport, Tennessee Cumberland-Harpeth Chapter Nashville, Tennessee Warito Audubon Society Clarksville, Tennessee	
National Wildlife Federation, Washington, D. C.	
Natural Resources Defense Council, Inc., Washington, D. C.	
Sierra Club Chattahoochee Chapter Huntsville, Alabama State Chapter Nashville, Tennessee	

COMMENTS REQUESTED	COMMENTS RECEIVED
Tennessee Conservation Leaque	
Tennessee Environmental Council	
Tennessee Farm Bureau Federation	
President Columbia, Tennessee	
Director of Research Columbia, Tennessee	
Tennessee Wildlife Society	
The Wildlife Society, Washington, D. C.	
Tennessee Chapter-The Wildlife Society	X
Wildlife Management Institute, Lawrenceburg, Tennessee	
Mr. Allen McComb, Master-Tennessee Grange	
Bradley, Arant, Rose and White; Attorneys	
Mr. Don Darden, Columbia State Community College	
Dr. H. Paul Friesema, Northwestern University	
Mr. Gene Gonsoulin, Volunteer State Community College	
Mr. Gerald Smith, Director of Chucalissa Museum	
Mr. Richard K. Smith, Birmingham, Alabama	
Mr. Bob Truett, Birmingham, Alabama	X

Comments and Responses

Each issue, problem, or objection is summarized or quoted and a response given on the following pages. The letters of comment are attached as appendix B.

Department of the Army, Washington, D.C.

1. Comment: "The draft environmental impact statement is considered adequate."

   Response: Noted.

Department of the Army, Nashville, Tennessee

1. Comment: "We have reviewed the Draft Environmental Impact Statement and have no comments."

   Response: Noted.

Department of Health, Education, and Welfare

1. Comment: "We have reviewed the revised subject Draft Environmental Impact Statement. Based upon the data contained in the draft, it is our opinion that the proposed action will have only a minor impact upon the human environment within the scope of this Department's review. The impact statements have been adequately addressed for our comments."

   Response: Noted.

Department of Housing and Urban Development

1. Comment: "We have reviewed the information submitted along with your referral and, to the extent of our available staff resources, have investigated the environmental impact, adverse effects, alternatives, short-term uses of the local environmental and long-term productivity and irreversible and irretrievable commitment of resources which the project involves. From the information available to us, we find no basis for formal comment because of special HUD interest or expertise. The Department indicated that relocation of businesses and residences was not adequately discussed."

   Response: Noted. Relocation is discussed in detail in the PLANNED PROJECT section of this document.

U. S. Department of the Interior

The Department's letter contained comments on the Draft Watershed Work Plan as well as the Draft Environmental Impact Statement. Comments concerning the work plan were considered in preparing the final document but were not summarized in the environmental impact statement. The following is a summary of the Department's comments on the Draft Environmental Impact Statement and a response to each comment.

1. Comment: "In Part V, Summary of Environmental Impacts, the first sentence does not constitute environmental impacts but reads as if it were a list of project goals. This should be placed in the section entitled, "Project Purpose and Action."

   Response: The sentence has been changed to read as an impact.

2. Comment: In the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Mineral and Ground Water Resources subsection, it is stated that "no current mineral production is known in Lauderdale County, Alabama. In Wayne County, Tennessee, only sand and gravel are being produced, but crushed stone has been produced and should be produced in the future. The proposed structures will preempt future extraction of these surficial deposits from project sites, but the proposals will not significantly affect their supply in the general area".

   Response: No response required.

3. Comment: In the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section of the Work Plan, it is stated that "the Chattanooga Shale lies beneath this watershed at depths from 100 to greater than 250 feet and is a potential source of low-grade uranium ore. The draft work plan adequately describes the mining of this radioactive material as a remote possibility. It should also be mentioned in the environmental impact statement".

   Response: The requested material was included in the EIS. See WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Mineral and Ground Water Resources subsection of Final EIS.

4. Comment Summary: The statement does not adequately identify cultural resources nor does it adequately assess the project's potential impact on these resources. It is reported that an archaeological survey was made, however, it does not give information relating to the types and relative values of cultural resources encountered and does not assess project impacts upon them. Also, the statement regarding the National Register should indicate consultation with the most recent list (February 4, 1975, and succeeding monthly supplements).

Response: The ENVIRONMENTAL SETTING section, Archaeological, Historical, and Unique Scenic Resources subsection has been modified to indicate that the Archaeological Site Survey report by the Department of Anthropology of the University of Alabama is available for review at the USDA, Soil Conservation Service office in Auburn, Alabama. The report is quite large and not feasible to include in the EIS. This report provides detailed information on each archaeological site found during the survey. The ENVIRONMENTAL IMPACT section, Archaeological, Historical, and Scientific Resources subsection, provides a breakdown of archaeological sites which will be inundated by floodwater retarding structures or disturbed by channel work. The EIS has also been modified to include all historic sites within the watershed as shown in the February 4, 1975 Federal Register and succeeding monthly supplements. All sites shown in the EIS are in Lauderdale County, Alabama. No sites are listed in the Federal Register and its supplements for Wayne County, Tennessee.

5. Comment: "The reference to the Reservoir Salvage Act (P. L. 86-523) should be updated with a reference to the amendments to that Act of May 24, 1974 (P. L. 93-291). The final statement should contain information demonstrating compliance with the Advisory Council on Historic Preservation's (ACHP) "Procedures for the Protection of Historic and Cultural Properties" (36 CFR, Part 800). The final statement should contain correspondence indicating contact with the State Historic Preservation Officer, particularly if any cultural resources may become eligible for nomination to the National Register of Historic Places."

Response: The ENVIRONMENTAL IMPACT section, Archaeological, Historical, and Scientific subsection has been amended to include reference to P. L. 93-291. The Alabama Historical Commission has made a review of all historic and architectural sites or structures in Lauderdale County. There were no prominent archaeological evidences found in the Alabama Historical Commission records or discovered during an on-site investigation. The Commission concluded that construction of the Cypress Creek Watershed Project will have no adverse affect on any historical sites and/or structures. Correspondence from the Alabama Historical Commission confirming the above information is included in appendix B of this document. Please note approval of State Historical Preservation Officer in lower left hand corner. The Tennessee Historical Commission, whose Executive Director is the State Historic Preservation Officer, reviewed the Cypress Creek EIS. The Commission does not have any objections to the proposed project. Their letter of response is also included in appendix B. Statements have been included in the EIS and plan to show that compliance with existing procedures concerning archaeological resources have been adhered to.

6. Comment: In the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, "it is stated that the watershed contains no wetlands as defined in Circular 39. However, it is stated that bald cypress grows in swamps in the lower part of the flood plain. Wooded swamps are specifically identified in Circular 39 as wetlands. The acres of wetlands should be quantified".

   Response: Concur. The wooded swamps have been classified as wetlands in the final documents as suggested.

7. Comment: The WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Non-Consumptive Resources subsection "alludes to significant water quality parameters which were not included. These data should be included to provide the reader with all available information".

   Response: The water quality parameters mentioned in this section are qualitative descriptions taken from Dr. Yokley's report. A more detailed discussion was presented in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Surface Water Resources subsection. In addition, average values of these parameters have been included for further clarification.

8. Comment: In the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Vertebrates subsection, "it appears that valuable information was deleted. The reader is encouraged to consult distribution maps of the fishes as presented by Boschung, yet no maps are presented. Also, a list of fishes supposedly gives specific information about the habitat requirements of each fish, but the list is conspicuously absent. The data should be included in order to properly evaluate the impacts on the fishery resources".

   Response: The EIS has been modified to delete references to distribution maps and list of fishes which are not a part of this document. A list of fishes with percent relative abundance and percent occurrence is included in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section.

9. Comment: The WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Vertebrates subsection "should state that the slackwater darter is being considered for listing by the Department of the Interior as an endangered species. Consequently, the Soil Conservation Service should review this project, as required by Section 7 of the Endangered Species Act of 1973, and demonstrate in the EIS how the proposed construction would affect this species".

   Response: Consultation with Dr. James Williams of the U. S. Fish and Wildlife Service indicates the slackwater darter is being considered as a threatened species and not as an endangered species. As indicated in the EIS, Dr. Herbert T. Boschung of the University of Alabama, Department of Biology, has made a study A Report On The Fauna Of The Cypress Creek Watershed, With Emphasis On The Fishes.

From this study Dr. Boschung concluded "In summary, we know of no single species of fish that will be extirpated or decimated (as a species) from the Cypress Creek Watershed area as a result of the proposed alterations".

Dr. Boschung is now engaged in additional study to determine the critical habitat and range of the slackwater darter. In consideration of the results of this study, final project design and construction will be undertaken in such a manner as to assure that no project elements will be installed which would jeopardize the continued existence of this threatened species.

10. Comment: "The statement does adequately describe and evaluate recreation resources and related environmental values. We would, however, like to correct one inaccuracy in the statement. It is stated that Cypress Creek was studied for inclusion in a state (Alabama) plan for wild and scenic rivers but was not accepted by the Bureau of Outdoor Recreation. The Bureau does not pass judgment on the acceptability of streams included in a State's wild and scenic rivers program. Although the Bureau may provide technical assistance on State rivers studies if it is requested, the decision on whether or not to include a river in a State wild and scenic river system is exclusively the State's".

    Response: Reference to BOR has been deleted.

11. Comment: In the ENVIRONMENTAL IMPACT section, Fish and Wildlife subsection misleading and inaccurate data is presented. "Loss of forest land will result in the direct loss of those members of the wildlife community dependent upon that habitat. This statement should include a discussion of the project-induced losses of forest habitat (669 acres direct and 602 acres indirect) as well as the resultant loss of those animals dependent on that habitat".

    Response: The statement has been changed to reflect this impact.

12. Comment: In the ENVIRONMENTAL IMPACT section, Fish and Wildlife subsection, "the use of conclusions reached by the University of Georgia study of small watershed projects geographically far removed from the subject project site should be tempered with qualifications. The statement was taken out of context and no explanation of the true nature of that study is given".

    Response: Reference to the report has been removed from the EIS and Plan.

13. Comment: Under the ENVIRONMENTAL IMPACT section, Adverse Environmental Effects subsection, "Item No. 8, the wildlife living on the construction sites will not be simply displaced. Total wildlife numbers in the immediate area will be reduced in direct proportion to the reduction of habitat and its carrying capacity in that area".

Response: The Adverse Environmental Effects, Item No. 8 has been changed to reflect the changed habitat and subsequent reduction of certain wildlife populations.

14. Comment: Under the ENVIRONMENTAL IMPACT section, Adverse Environmental Effects subsection, "Item No. 10, the effect of project structures and channel work on fishery resources should be quantified in terms of the miles of stream habitat that will be destroyed".

Response: Item 10 has been modified to reflect the suggested information.

15. Comment: In the IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES section, "the fact that the loss of forest land will adversely impact wildlife populations should be mentioned".

Response: The section has been modified to indicate that wildlife will be adversely affected by the loss of forest land.

Department of Transportation

Comment: "The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project."

Response: Noted.

U. S. Environmental Protection Agency

1. Comment Summary: If the project is to proceed, appropriate federal permits may be needed pursuant to Section 402 and 404 of Public Law 92-500, and Section 301(a) of the Federal Water Pollution Control Act Amendments of 1972.

Response: The plan and EIS have been modified to state that legal requirements will be fulfilled by the sponsoring organization prior to initiation of construction.

2. Comment: "Furthermore, utmost care should be taken to prevent spoil, etc., deposited on the streambanks from washing or falling back into the stream since it may result in violation of Federal laws."

Response: It is not proposed that spoil, etc., be deposited on streambanks, rather spoil will be buried under topsoil and the disturbed area vegetated. Additionally, this technique will be accomplished some distance from the stream channel. See appendix D; PLANNED PROJECT section, Channel Work subsection; and reply No. 9 to your comment regarding "why is spoil to be buried" in this section.

3. Comment Summary: Ground water will probably be affected by channelization through lowering of the water table. Rural domestic water supplies should be protected.

Response: Analysis of similar channel work of the type proposed for Cypress Creek indicates that the water table will be altered where the water level in the channel is changed. However, the effect is significant only a few feet from the channel banks. Cypress Creek channel is being deepened only slightly, essentially a restoration to a former condition, and, therefore, the water table will be lowered a few inches within a narrow band alongside the reworked channel.

Rural domestic water supplies in Cypress Creek Watershed are almost without exception from upland wells or flowing springs that receive water from upland recharge. Shallow flood plain wells are the only ones which might be affected by small local water table change. Overall, ground water recharge is expected to increase because infiltration and water holding capacity will be improved by conservation land treatment and cropping systems.

4. Comment: "Even through water quality problems may be minor before the project is started, precautions should be taken to minimize erosion."

Response: The PLANNED PROJECT section discusses precautions that will be taken to prevent erosion during construction.

5. Comment: "We also advise continous monitoring of all sediment traps in the basin to detect problems so that corrective measures can be taken early to minimize further degradation."

Response: Construction of sediment traps is a standard technique usedi in installation of floodwater retarding structures and channels. These basins, although not specifically located in the plan, will be inspected (monitored) routinely and should they become filled or damaged, immediate corrective measures by the contractor are mandatory.

6. Comment: "Efforts should also be made to assure that adequate controls are used to prevent ground water quality degradation."

Response: It is not anticipated that work in Cypress Creek Watershed will have any affect on quality of ground water; however, should any problem arise, appropriate measures will be taken to insure against degradation of quality.

7. Comment: In the ENVIRONMENTAL IMPACT section, it is stated that "the small reduction of cropland, with the planned project implemented, should result in a slight reduction in pesticide use". It is suggested that this is contradictory to the chart in the same section which shows an increase from 39.2 percent cropland without the project to 43 percent with the project.

   Response: The sentence has been changed to read, "the small reduction of total watershed cropland, with the planned project implemented, will result in a slight reduction in pesticide use". Protection from flooding will cause an increase in cropland in the flood plain of 390 acres. This will be offset by 689 acres of less productive upland cropland being seeded to pasture. Therefore, a slight reduction in total watershed cropland is expected.

8. Comment: "Why is the project to be carried out in two stages?"

   Response: The structures will be installed as a "first stage" followed by the channel work. The flood flow reduction afforded by the structures reduces the erosion potential during the vegetative establishment period on areas disturbed by channel work. The channels are designed considering the floodwater retarding structures installed.

9. Comment: "Why is spoil to be buried?"

   Response: The excavated spoil material is a coarse cobbly gravel with small amounts of clean sand. This material is sterile of nutrients required to support vegetation. If the spoil is left exposed in the flood plain, large rains will wash and scatter the material, eventually returning it to the streambed. With the spoil buried under topsoil, vegetation can be established, holding the spoil in place.

10. Comment: Does "the Threet Creek Cutoff, which 'eliminates two miles of channel work' also eliminate two miles of stream?"

    Response: The proposed work for Threet Creek and North Fork Creek is in lieu of two miles of channel work that would be required to obtain the same results by following the existing flow route. Existing stream channels throughout the two miles have filled with sand and gravel and are generally nonfunctional for transporting water. This causes water to flow over the flood plain along alternate routes. Although the two miles of existing channel will not be disturbed by construction activities, the new channel will direct flow away from this area. No measurable impact to fish and wildlife values in these existing channel reaches are anticipated.

11. Comment: "In light of our review and in accordance with procedures, we have assigned a rating of ER-(environmental reservations) to the project and 2-(insufficient information) to the impact statement."

Response: We have coordinated preparation of the final EIS providing additional information to EPA to resolve the ER-2 rating. The following quote from EPA was transmitted by letter on January 23, 1976. The letter is included in appendix B. "We have reviewed your responses to our May 27, 1975, leter of comments on the draft environmental impact statement for Cypress Creek Watershed and find that you have satisfactorily addressed our environmental concerns."

Tennessee Valley Authority, Knoxville, Tennessee

1. Comment: "As indicated in TVA comments on previous drafts, the enactment of flood plain regulations should be encouraged since the project provides only an agricultural level of flood protection. We hope the flood plain restrictions mentioned under the abbreviated environmental quality plan in the addendum will be enacted and enforced, particularly in the urbanizing area outside Florence. We have been working with the city and would be willing to assist the SCS in working with the county concerning flood plain regulations, if you desire."

   Response: The Soil Conservation Service has flood frequency information for the portion of Florence affected by Cypress Creek main stream. This information can be made available to any agency or organization making flood plain studies. Flood plain regulation was considered as an alternative but rejected. See ALTERNATIVES section, Number 2. It is SCS policy under Public Law 566 to encourage flood plain regulation, however, the law does not provide for enforcement.

2. Comment: "The proposed channel work in the vicinity of Lindsey Creek and Middle Cypress Creek may require the relocation or modification of TVA's existing 161-kV transmission line from Colbert Steam Plant to Mt. Pleasant substation. As final plans are formulated, they should be corrdinated with Henry A. Kyle, Jr., who is Superintendent of the Alabama-Mississippi District of TVA's Division of Power System operations. His office is at 522 First Federal Building in Florence, Alabama, and his phone is (FTS) 383-4511. No future transmission facilities are now planned for the area covered by the project."

Response: Channel work in the vicinity of the TVA transmission line will follow the existing channel alignment, therefore, the transmission line should not be effected. However, final designs will be coordinated with TVA to insure that no problems arise as a result of channel work as suggested.

Tennessee Valley Authority, Muscle Shoals, Alabama

1. Comment: "Are provisions being made for technical assistance to develop potential for waterfowl and fish management in the 19 permanent pools?"

   Response: Yes; the EIS has been modified to reflect this technical assistance.

2. Comment: "Would the term 'Plinthite' be more appropriate than 'hardpan'?" (WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Geology subsection.)

   Response: Plinthite is an appropriate term but hardpan was used because it describes as well as explains the type layer referred to.

3. Comment: "Should the word be 'comulative' or 'cumulative'?" (ALTERNATIVES section, No. 7.)

   Response: The word is cumulative. Correction has been made.

4. Comment: "Is the proper word here 'property' or 'project'? It seems that real property would have indefinite life in context of the sentence." (PLANNED PROJECT section, Operation and Maintenance subsection.)

   Response: The proper word was 'property', however, the section has been reworded for clarity.

5. Comment: "In the discussion of disposal of bedload material removed from channels, there is considerable effort to describe methods of burial and considerable expense to be made in the process of burial. Could the material be used for construction materials such as gravel for driveways or low traffic roads, building foundations, fill for swamp areas, etc?"

   Response: The material could be used as construction material, however, there is an abundance of this material in the area. The selected method of disposal will not preclude commercial use of

the material in the future. The cost of stockpiling the material outside of the flood plain would exceed the cost of burying the material.

Tennessee Valley Authority, Chattanooga, Tennessee

1. Comment Summary: The water use classifications adopted on May 5, 1967, by the Alabama Water Improvement Commission were based on existing water uses and not the potential for future use as indicated in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Surface Water Resources subsection. A statement in the same section implies that water quality in Cypress Creek and its tributaries needs improvement to meet the use classifications.

   Response: Correction has been made to indicate the classifications are for present use. Reference to needed improvement has been deleted.

2. Comment Summary: The water use classifications shown on the Water Use Classification table of the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Surface Water Resources subsection are those adopted in 1967. An amended listing (September 17, 1973) is available from the Alabama Water Improvement Commission.

   Response: Concur. The 1967 listing has been changed to reflect the amended listing of 1973.

3. Comment: In the WATER AND RELATED LAND RESOURCE PROBLEMS section, Municipal and Industrial Water Problems subsection it is stated that "Florence, Alabama public water supply intake is located at Cypress Creek mile 8.5; however, the effect on the water supply of increased turbidity levels resulting from bedload removal is not addressed."

   Response: The turbidity level at the water supply intake could be slightly increased during bedload removal but will be reduced by about 47 percent when the entire project is installed. Additional information on the effects of bedload removal on the water intake has been included in the ENVIRONMENTAL IMPACT section, Water Supply subsection.

4. Comment: It is stated in the ENVIRONMENTAL IMPACT section, Flood Prevention, Erosion and Sediment subsection that "the project will have very little effect on dry-season streamflow." We recommend that minimum flow releases from all the FRS be equivalent to or

exceed the natural 7-day, 10-year minimum flow especially on Lindsey Creek which receives treated effluent from Central High School. The minimum 7-day, 10-year flow of Lindsey Creek at the Natchez Trace Parkway is estimated to be 530,000 gallons per day.

Response: The FRS on Lindsey Creek will not be a restriction to the normal passage of the 7-day, 10-year low flow. The releases from the FRS have been designed so as to allow the normal baseflow from the stream to pass through the structure without being restricted. The 7-day, 10-year low flow of 530,000 gallons per day is about 0.8 cfs or 0.15 csm.

5. Comment: "What arrangements will be made for disposal of the waste water from the displaced hog farm waste treatment lagoon" at Site No. 13?

Response: All of the waste water will be pumped out and sprayed over nearby pasture. The bottom and sides of the lagoon will be excavated for about 2 feet. This material will be spread over either nearby pastureland or spoil areas within the project area. The embankment will be removed and spread over the excavated area. The entire area will then be shaped and smoothed to prevent the ponding of water. The drainage pattern should be essentially the same as before the lagoon was installed.

6. Comment: "What provisions have been made for the disposal of sewage from the rural residential developments identified adjacent to Sites Nos. 20 and 21? Based on the information provided by the Soil Association Map, appendix E, the soil types identified in the general area of the developments are noted for poor soil absorption rates, which will interfere with subsurface sewage disposal systems. If a discharge below the proposed impoundments is anticipated, Comment No. 4 regarding minimum flow releases would be applicable."

Response: The residential development adjacent to Site No. 20 is in the Bodine-Dewey-Dickson-Fullerton Association. The Bodine, Dewey, and Fullerton soils have none to slight limitation rating for septic tank absorption fields on slopes of less than 8 percent. On steeper areas the slope limitation is easily overcome by designing the absorption field on the contour. The Dickson soil has a severe limitation rating because of slow percolation. The Alabama State Health Department requires a detailed soil survey for each residential development and a percolation test on each lot in the development. They will not approve septic tanks on those lots having slow percolation rates.

The development adjacent to Site No. 21 is in the Dewey-Decatur-Dickson Association. Dewey and Decatur soils have a none to slight limitation rating on slopes of less than 8 percent. Slope limitations are overcome by designing absorption fields on the contour. The Dickson soils were discussed previously. (For additional information on sewage dilution, see response to Comment No. 4.)

7. Comment: The statement in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section "referring to BOR's unacceptance of Cypress Creek as an Alabama scenic river is inaccurate. BOR does not establish criteria for state scenic rivers but screens potential candidates for inclusion in the National System of Wild and Scenic Rivers. As a matter of fact, we were unable to find any mention of Cypress Creek in the reference cited. However, in Volume 5 of the Alabama Statewide Comprehensive Outdoor Recreation Plan, Cypress Creek is mentioned as one of eleven streams recommended by the Governor of Alabama in 1968 for possible inclusion in the national system but the results of this recommendation were unavailable for the report. We suggest this reference be checked."

   Response: The correct reference for this information is in Volume 11, page 110. Footnote correction has been made and reference to BOR deleted.

8. Comment: "No discussion is made of the influence of the Cypress Creek Project on canoeing in the downstream of the creek. This recreational pursuit attracts significant numbers of canoeists from the surrounding area."

   Response: No change made in the EIS. As presently planned, the project will not significantly affect canoeing in the downstream portions of Cypress Creek.

9. Comment: "The proposed channel work in the vicinity of Lindsey Creek and Middle Cypress Creek may require the relocation or modification of TVA's existing 161-kV transmission line from Colbert Steam Plant to the Mt. Pleasant Substation. As final detailed plans are formulated, they should be coordinated through Mr. Henry A. Kyle, Jr., District Superintendent, Alabama-Mississippi District, 522 First Federal Building, Muscle Shoals, Alabama 35660."

   Response: See TVA, Knoxville, Tennessee response to Comment No. 2.

10. Comment: "The initial filling of the sediment pools with water will result in a relatively small loss of power at Pickwick and Kentucky dams."

    Response: Pickwick Reservoir, the first hydro-electric dam downstream of Cypress Creek, has an estimated capacity of 688,000 acre feet at normal pool. There are 19 dams scheduled for installation over a 10-year period in the Cypress Creek project. A maximum of 3 dams will be constructed in any one year. Installing the 3 largest pools (13, 20, and 21) will initially retard 954 acre feet of water. This represents .01 percent of the volume in Pickwick Reservoir. The lakes downstream will be affected to a lesser degree. This will make the power loss negligible in any one year.

11. Comment: "Has full consideration been given to the disposition or modification of the 19 earth dams after the sediment pools are filled?"

    Response: No disposition or modification of the dams are anticipated. Sediment will gradually encroach upon retarding storage capacity unless removed. However, sediment storage is a small part of the total storage requirements.

12. Comment: "Macroinvertebrates--the subject Draft EIS does not contain sufficient information for an independent review of potential impacts on aquatic macroinvertebrates."

    Response: Additional information was included to assist the reviewer with his independent review in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Non-Consumptive Wildlife Resources subsection.

13. Comment: "There is no evidence in the EIS or the Draft Watershed Work Plan for Cypress Creek Watershed to support the statement in the 'Abbreviated Environmental Quality Plan,' first sentence, that the project will '. . . preserve and enhance the biological resources and ecosystems;. . .'

    Response: The Abbreviated EQ Plan has been modified and an introductory statement added to explain the purpose of the EQ Plan.

14. Comment: "Presence of three families, 12 genera, and 26 species of clams and mussels and six families and 12 genera of snails (number of species not stated), along with 14 families, 31 genera, and 56 species of fishes indicates Cypress Creek has a highly diversified aquatic fauna characteristic of a pristine environment rather than a deteriorating one as implied in the statement."

Response: Deterioration in the aquatic environment refers primarily to the increase in sediment and bedload material. The stream is clogged in several reaches to the extent that there is no above ground flow in late summer. Diversity and numbers of aquatic species has decreased as evidenced by earlier collections.

15. Comment: "Plant Resources--Flooding of the bottom land forest types along the flood plains within the watershed cannot be considered a significant loss. Flooding of forest land along the streams for significant periods also occurs during the dormant season and does not adversely affect the survival or vigor of the naturally regenerated species. In fact, research evidence indicates that flooding, such as that occurring along Cypress Creek and its tributaries, usually increases the growth rate of the more water-tolerant species. In summary, periodic flooding of the forest land can be considered beneficial."

Response: No monetary damages were calculated for flooding of forest land and the level of protection provided will not significantly affect forest growth and development.

16. Comment: "Water-loving plants is a misnomer and connotes anthropomorphism. Water-tolerant species would be more appropriate terminology."

Response: The statement has been changed as suggested. Some hydrophytes are expected to develop along the edges of permanent pools but not in the flood storage areas.

17. Comment: "Forest land improvement practices are scheduled for 5,700 acres (2,000 acres for tree plantings and 3,700 acres for improvement cutting) over a 10-year period; however, since the '. . . landowners and land users make the decisions. . .' on implementation of conservation plans and forest management plans, these acreages are likely, in reality, only optimisitc goals."

Response: Conservation plans are records of landowner and land user decisions. Soil and Water Conservation District Cooperators have an oustanding record of voluntarily applying conservation practices. Alabama Forest Commission records show that 3,570,000 trees were planted on about 4,460 acres in Lauderdale County, Alabama during the past ten years (1965-1975).

18. Comment: "Baldcypress (Taxodium distichum) is indigenous to the Cypress Creek Watershed and reaches its most easterly distribution in the Tennessee River Watershed. Efforts to protect the integrity of this locally sparse species should be encouraged."

Response: The map of Major Forest Types in The South, 1963, shows oak-gum cypress in the flood plains of streams in the southeast. Although not a part of this document, the Soil Conservation Service is participating in the development of a State list of endangered or threatened flora and fauna. The "baldcypress" does not appear on this list.

19. Comment: "Excessive removal of riparian trees will likely result in increased bank erosion and stream migration during maximum flows."

Response: A 3-year establishment period for stabilizing the channel banks is outlined in the PLANNED PROJECT section, Operation and Maintenance subsection of the EIS. The construction methods used to install the channel will minimize bank erosion during construction. Stability analysis indicate that the channel will be stable in the aged condition.

20. Comment: "Increased stream heating and increased pool warming of the flood retarding structure pools will certainly occur."

Response: The EIS has been modified to reflect this impact.

21. Comment: "Loss of the base food supply for stream macroinvertebrates is inherent with tree removal."

Response: The EIS has been modified to reflect this impact.

22. Comment: "Fauna--The avifauna of riparian vegetation was not discussed or studied, and habitat depletion by clearing and channelization may have a significant impact on these populations."

Response: The avifauna of riparian vegetation was not discussed in depth since no significant impact was anticipated. Only a small percent of riparian vegetation in the watershed will be altered and thousands of acres of similar habitat exist in surrounding areas. The subject is discussed in the EIS in the ENVIRONMENTAL IMPACT section.

23. Comment: "Wood duck habitat for Cypress Creek has been evaluated by TVA biologists. Ratings of good, fair, and poor are based on criteria that include the presence of water during breeding seasons and mature riparian hardwood vegetation. We find that the proposed project will impact 42 miles of fair wood duck breeding habitat. This amounts to 72 percent of all wood duck breeding habitat in the Cypress Creek Watershed and 34 percent of wood duck habitat in Lauderdale County. It is difficult to agree with the draft statement that effects will be insignificant."

Response: The Alabama Department of Conservation and Natural Resources did studies in Crow Creek Watershed to determine the effects of PL-566 channel work on wood duck habitat. The channel work involved about 50 miles of stream modification. The study indicated that wood duck populations had increased after project installation (see Annual Progress Report for 1971, Department of Conservation and Natural Resources, Crow Creek Watershed, Alabama and Tennessee). The Crow Creek Watershed is similar to Cypress Creek Watershed and is also a tributary to the Tennessee River about 50 miles upstream of Cypress Creek Watershed. Based on the Department of Conservation and Natural Resources' study, the channel work in Cypress Creek Watershed will effect wood duck habitat representing an average annual production of four broods or about 26 ducks. This represents less than 20 percent of the wood duck habitat in the watershed according to observations by SCS biologists.

24. Comment: "Fish--The placement of water control structures on the upper reaches of Cypress Creek will limit the breeding habitat for an apparently already declining fish population by presenting barriers to migration. White bass fishing along Cypress Creek has been considered an area attraction for many years."

Response: The EIS has been modified to reflect this impact.

25. Comment: "Rare and endangered species--In general no identification of stream species, other than fish, seems to have been made and then compared with available or proposed lists."

Response: This was accomplished by field studies conducted by Dr. H. T. Boschung and Dr. Paul Yokley, Jr.

26. Comment: "Blood-sucking Arthropods--No provisions have been made in the draft statement to provide for the control of blood-sucking arthropod pests (particularly mosquitoes) in the areas subject to impoundment."

Response: Some biological control on mosquitoes can be expected from aquatic organisms and avifauna. In addition, FRS are remotely located in relation to human populations so as to minimize undesirable impacts from mosquito problems. Aquatic plant growth will be discouraged in shallow areas by deepening the water line.

27. Comment: "No provisions have been made in the draft statement to provide for control of floodwater species of mosquitoes. During the spring and early summer, at the height of the rainy season, large flat plains will be flooded and then gradually dewatered."

Response: The average annual storm will not create flood pools for more than 2 or 3 days. Furthermore, this prevents downstream flooding over a much larger area. The net results of the FRS would be to reduce the favorable mosquito breeding habitat that is dependent on temporary flood waters.

The Attorney General, State of Alabama

1. Comment Summary: There does not appear, within the covers of the EIS, to be any real need for such a project in the area.

   Response: See WATER AND RELATED LAND RESOURCE PROBLEMS section for a description of watershed problems.

2. Comment: "The cost-benefit ratio is so low as to make the project counter productive."

   Response: The benefit-cost ratio is 1.3:1.0 without secondary benefits and 1.9;1.0 with secondary benefits. See ENVIRONMENTAL IMPACT section for explanation of benefits.

3. Comment: "The major benefit to be derived from the project seems to be the amount of money pumped into the economy by the construction work. Three hundred twenty-five (325) semiskilled and eighteen (18) skilled jobs would be generated. The benefits from flood control are absolutely marginal."

   Response: The purpose of the project is not to provide jobs through construction or pump money into the local economy. See appendix A. Damages from flooding alone are reduced $289,150 on an average annual basis. Enhancement benefits of more intensive land use, changed land use, and land use and development amount to $248,400 average annually. Redevelopment benefits, which result from wages paid to local labor, amount to about $111,100 or 10 percent of total benefits. In addition, project installation will generate about $284,400 of secondary benefits through the income multiplier effect (i. e. Income multipliers reflect the total change in income in the economy when disposable income changes in any one sector. Increased income in a watershed is an example of a sector where disposable income will change as a result of flood protection).

4. Comment: "Fifty (50) miles of fence would not be hurt by flooding. That is silly. Some roads wouldn't be closed. Some inconvenience for travelers would be alleviated."

   Response: All data presented in the EIS was obtained from interviews with landowners and local people. Data is supported with documentary photographs and has been reported in local newspapers.

5. Comment: "The people of the State of Alabama would have to allow a stream to be turned into a ditch."

   Response: The planned work is not turning a stream into a ditch. The work will result in restoring and preserving the stream. It is presently being filled with sediment.

6. Comment: "The taxpayers of the United States would have to pay approximately $9 million. Sir, if you put the money in a bank at 5% simple interest, each year the interest earned would be enough to cover any flood damages and pay welfare to those who would have had jobs from the construction."

   Response: The suggested alternative is not viable. There are no provisions for implementing the proposal nor would it meet the sponsors objectives.

7. Comment: "Because of our concern for the environment of the State, and the concern of many private citizens expressed to us about the project, our office requests that a formal meeting be held on this project."

   Response: A sufficient number of public meetings have been held to give the public ample opportunity to comment. A public meeting was held as recent as March 25, 1975 in Florence to review the draft EIS and Work Plan. Notice of this meeting was published in the local newspaper for two consecutive weeks prior to the meeting. This meeting was in keeping with regulations of the Soil Conservation Service published in the Federal Register on June 3, 1974. In addition, 35 meetings have been held with interested agencies, sponsors and interest groups during plan development. See CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS section for further information.

Alabama Department of Conservation and Natural Resources

1. Comment Summary: The Department stated that the loss of production was not included in the project costs and inferred that the cost per acre of providing protection is high. The Department presented data on the cost per acre of providing flood protection.

   Response: The loss in production or the value of the land rights (whichever was greater) was used to determine the project cost. We could not ascertain how the Department arrived at the figures provided in the letter of comments. The cost per benefited acre, considering the 100 year flood plain of 10,321 acres is considerably less than that stated in the Department's letter.

2. Comment: In the PLANNED PROJECT section the following statement is found: "In the area of channel work, the upper one-third of bank is primarily silt and the lower two-thirds is primarily silty gravel. This statement indicates that the banks of Cypress Creek are very unstable and any mechanical disturbance such as that created by channelization operations will result in severe bank erosion and sluffing following each rise and fall of water within the stream. It is reasonable to assume that much of the eroding silt and gravel will be deposited downstream in Cypress Creek, the remainder will be deposited in Pickwick Lake."

   Response: The upper one-third of bank material is high in organic content and vegetation can be established with minimal effort. This vegetation will stabilize the movement of soil from the upper one-third of the channel bank.

   The lower two-thirds of the bank is coarse gravel and cobbles embedded in a fine cemented silt. Vegetation will be fairly hard to establish. However, the size of the particles and the cementing silt will retard erosion of the bank material. A 3-year establishment period is outlined in the PLANNED PROJECT section to insure a vegetative cover. The sponsors are responsible for maintaining the channels in a stable condition.

   After the project is installed, there will be a 47 percent reduction each year of gravel and silt that would have been desposited in Pickwick Lake.

3. Comment: "The Game and Fish Division of the Alabama Department of Conservation and Natural Resources is of the opinion that the original proposal by the SCS to limit the mechanical bedload removal from the stream to maximum segments of 300 feet rather than the one-fourth mile now proposed would result in less environmental damage. It would appear that the shorter segments should reduce the extended areas of mechanical disturbance thereby benefiting both fish and wildlife."

   Response: This was the first method considered in removing the bedload material. Analysis of the bedload material which is to be removed indicated that the original proposal would not achieve the desired results.

4. Comment: "The use of excavated trenches for the deposit of spoil removed during initial channelization work, and periodically thereafter, as the excavated sections of the stream are filled will, in our opinion, create additional environmental damage. It would appear that this spoil material could be used for filling the numerous gullies reported to occur within the watershed with less environmental damage."

Response: The critically eroding areas map (appendix G) indicates the location of 15 gullies and borrow pits. The remaining 42 areas are roadbanks. The excavated material from channel work would be useful in repairing the 15 gullies and borrow pits, however, the feasibility of transporting the material is questionable. The 42 roadbanks are not eroded to the extent to need fill material such as will be excavated from the channel. For these reasons, it is most feasible to bury the excavated material near the channel. The excavated trenches for burial of bedload will be located so as to minimize damages to the environment. Where possible the trenches will be in open areas such as pasture to prevent disturbing the trees and wildlife habitat along the channel bank. The spoil will be covered with topsoil and vegetated thus the disturbance to the environment should be minimal.

5. Comment Summary: It appears to us that environmental damages could be drastically reduced if the floodwater reservoirs were designed as "dry reservoirs". Nothing in the draft environmental impact statement indicated that "dry reservoirs" were considered as alternates to permanent pool reservoirs.

Response: Dry reservoirs were considered. However, after the reservoirs have accumulated several feet of sediment most species of trees in wooded sites will die and fall. This debris will float creating a problem of slowing down or stopping flow through the principal spillways causing constant maintenance problems and possible damage to the structure.

Alabama Historical Commission

1. Comment: "After a thorough review of our current historic and architectural inventory for Lauderdale County, an examination of historic and current maps relevant to the project and onsite inspections of the area by interested preservationists, the Alabama Historical Commission concludes that the construction of the project will have no adverse affect on any historical sites and/or structures.

There were no prominent archaeological evidences discovered during our record and site examination. Should your construction activity uncover any such evidences, please contact the Alabama Historical Commission for immediate salvage operations."

Response: Noted.

Alabama State Soil and Water Conservation Committee

Comment: "On behalf of Governor George C. Wallace, the State Soil and Water Conservation Committee has reviewed the "Cypress Creek

Watershed Work Plan," Lauderdale County, Alabama, and Wayne County, Tennessee, and the "Draft EIS" pertaining to this proposed project. We find both documents to be in proper order."

Response: Noted.

Alabama State Highway Department

Comment: "We have no objections to the proposed Cypress Creek Watershed Project, nor do we have any comment relative to the statements and conclusions the Draft EIS contains. It may be beneficial to the Highway Department and SCS to coordinate proposals. Our primary concern or comment with your proposal is that the State Highway Department be informed of all stream channelization, FRS, bedload removal or channel clearing and shaping where roadway or bridges would be involved."

Response: Any construction involving public roads and bridges will be coordinated with the Alabama Highway Department well in advance.

Tennessee Office of Urban and Federal Affairs

Comment: "As the designated State Clearinghouse for federal development program under OMB Circular A-95 guidelines, we have conducted a review of the draft environmental impact statement and work plan, dated December 1974 for the subject proposed project. This office highly urges that considerable attention and due consideration be given these comments and suggestions which are enclosed. Approval of this project by the State of Tennessee is conditional upon a favorable response from the sponsors and documentation and preparation of the final EIS and work plan which are acceptable."

Response: Noted. Following are the comments and responses from the agencies contacted by the Tennessee Office of Urban and Federal Affairs.

Tennessee Department of Agriculture

Comment Summary: The Cypress Creek Watershed Project in Lauderdale County, Alabama and Wayne County, Tennessee has been reviewed and evaluated by this Department. We have no objection to the project.

Response: Noted.

Tennessee Department of Conservation, Division of Planning and Development

Comment Summary: The Cypress Creek Watershed Project presents no conflicts with existing programs of the Tennessee Department of Conservation. The Federal Bureau of Outdoor Recreation has prepared a feasibility study for the development of Natchez Trace National Scenic Trail which traverses the general area of the project. The SCS should coordinate this project with plans for the trail's development.

Response: Concur. The project as planned will not interfere in anyway with the development of the Natchez Trace National Scenic Trail.

Tennessee Department of Conservation, Division of Forestry

Comment: We have reviewed the Draft EIS and find it to be adequate.

Response: Noted.

Tennessee Department of Public Health, Division of Sanitation and Solid Waste Management

Comment: As proposed in the PLANNED PROJECT section, "Floodwater Retarding Structures Nos. 1, 2, 3, 5, 6, 7, 10, 18, and 19 are located in Wayne County, Tennessee, and would be subject to the requirements of "The Tennessee Impounded Water Act" and the regulations adopted under the law (Tennessee Code Annotated 53-801 - 53-809).

"The EIS states that the sediment pools of the structures will be prepared to meet Health Department requirements. It also states that maintenance of the impoundages will be the responsibility of the sponsoring agency. It was not noted that anyone was responsible for securing permits as required by the law. It should be pointed out that prior to construction 'Application for Permit for Impoundage Construction' should be made for each impoundage in Tennessee and be accompanied by a plat of the impoundage. As each impoundage is completed, it should also be pointed out that prior to impounding water 'Application for Permit for Impoundage and Maintenance of Impounding Water' should be submitted with ample time allowed for an inspection by the Tennessee Department of Public Health to determine if construction requirements have been met."

Response: Concur. A statement has been added to the final EIS to indicate that the above law will be adhered to in constructing each floodwater retarding structure and any needed permits obtained.

Tennessee Department of Public Health, Division of Water Quality Control

1. Comment: "The accelerated conservation land treatment program, as proposed, would undoubtedly benefit water quality in the Cypress Creek Watershed by decreasing soil erosion problems in the area.... The treatment of critically eroding gullies and borrow pits by the SCS should also tend to lessen soil erosion problems and subsequent sedimentation in adjacent streams."

   Response: Concur.

2. Comment: "Water immediately downstream from the impoundments created by the permanent sediment pool dams should be lower in suspended solids concentrations due to the settling of these solids in the impoundment basins. In addition, some flow augmentation sould be accomplished through the gradual release of accumulated storm waters from the impoundments, a phenomenon which should extend the duration of stream flow in what might otherwise be intermittent streams. The provision of flood protection for local landowners, their outbuildings and fences, and for private and public roadways would also be realized."

   Response: Noted. No response required.

3. Comment: "Short-term destruction of aquatic life and habitat in the affected area would occur during the construction period."

   Response: This possible effect is recognized in the ENVIRONMENTAL IMPACT section, Adverse Environmental Effects subsection of the EIS.

4. Comment: "After construction, the impounded waters would be subject to temperature increases which would likely cause species changes within the reservoirs, a situation which is not automatically labeled detrimental."

   Response: The increase in warm-water lake habitat has been recognized in the ENVIRONMENTAL IMPACT section, Favorable Environmental Impacts subsection of the EIS. The increase in warm-water habitat was considered favorable due to the limited habitat of this type in the watershed whereas cool water species of fish have more than 160 miles of streams for habitat.

5. Comment: "Concerning the proposed channel improvement work, the Tennessee Division of Water Quality Control is concerned with the physical disruption and destruction of natural stream habitats. Such mechanical disruption of the streambed, alteration of the stream channel and bank, and removal of streambank vegetation invariably causes numerous water quality problems downstream, and in this case, channel alteration would ironically reintroduce the sediment load which is supposedly being removed by the construction of permanent sediment pool dams. Channelized streambank areas are notoriously susceptible to scouring and erosion where the vegetative cover has been removed. The increased sediment load introduced into the areas downstream from the channelization work would have definite detrimental effects upon aquatic life, and additional sediment loads would be introduced every time channel maintenance work was conducted in the channelized area."

   Response: It is recognized in several sections of the EIS that channel work will increase sediment movement due to erosion of newly excavated and disturbed channels. Also, a considerable amount of information has been included in the EIS explaining how this problem will be held to a minimum during channel installation. Stabilization of disturbed streambanks will be undertaken immediately following construction. The plan also includes provisions for treating existing unstable channels where no channel work is planned but where channels are presently contributing sediment to the stream system. The type and method of maintenance proposed for channels will not contribute any significant amount of sediment to the stream system (see PLANNED PROJECT section, Operation and Maintenance subsection).

Tennessee Historical Commission

   Comment: "From a review of the information submitted, it does not appear that the Cypress Creek Project will affect any plans or priorities of this agency."

   Response: Noted.

Tennessee Wildlife Resources Agency

1. Comment: "The statement of PURPOSES AND GOALS recognizes that landowners plan to convert more of the flood plain into cropland and pastureland with resulting flood protection. They also stated that they plan to manage the flood plain at a higher level since the threat of flooding would be reduced. It is the understanding of TWRA that there are 1,381.3 acres in Wayne County under the Cropland Adjustment Program (CAP). This program offers monetary

consideration to landowners not to plant various lands. It is, therefore, contradictory to partially justify this watershed program on the premise of providing or permitting more cropland development when in fact various lands are under agricultural programs calling for land retirement."

Response: The Cropland Adjustment Program (CAP) was authorized by the Food and Agriculture Act of 1965. The purpose of the program was to: assist farmers in turning their lands to non-agricultural uses; promote the development of conservation of soil, water, forest, wildlife, and recreational resources; and to establish, protect, and conserve open spaces and natural beauty. To participate, farmers diverted cropland normally used for production of allotment crops, feed grains, and other specified crops to approved practices and uses. CAP agreements ranged from 5 to 10 years. All CAP agreements expire no later than December 31, 1976.

There are eight CAP agreements in effect in the Wayne County, Tennessee portion of Cypress Creek Watershed. These eight agreements contain 349.2 acres of CAP land. Three of the agreements expire on December 31, 1975 and the other five expire on December 31, 1976. CAP agreements cannot be renewed. The Cypress Creek Watershed plan is not justified on providing more cropland. The increase in flood plain cropland reflects conservation of natural resources by providing for marginal upland cropland to be converted to other uses.

2. Comment: Land treatment measures stated in the PLANNED PROJECT section are to be accomplished through the development and implementation of conservation plans and forest management plans on individual farms. Accelerating this program is of considerable importance as referenced by erosion and sedimentation rates note in this EIS. The need for land treatment has been discussed in the Wayne County RECP Plan which noted needs on 44,424 acres of cropland in tillage rotation, 13,005 acres in other cropland, 4,339 acres in pasture, 348,115 acres of forest land, and 2,500 acres of other land. An unknown portion of this land is in the Cypress Creek Watershed. These needs have been known for several years, the above being condensed from the 1967 Conservation Needs Inventory. TWRA questions how SCS, through this watershed proposal, can assure the follow-up of recommended land treatment measures, particularly since the landowner or land user would have the final responsibility for implementation. This assurance might be further documented by results of similar watershed projects. What assurance can be given that maintenance would continue following completion of the developmental portion of the project?"

Response: The land treatment measures included in the watershed plan reflect only the portion of the total needs that landowners and land users are ready, willing, and able to apply. The quantitative goals were set after carefully considering: (1) the long range district programs for Lauderdale County, Alabama, Soil and Water Conservation District and Wayne County, Tennessee Soil Conservation District, (2) the total conservation needs of the land within the watershed, (3) the current rate of land treatment, and (4) the ability and willingness of landowners and land users to apply conservation measures. This process has proved successful in other watersheds. Land treatment application has exceeded the goals for most practices on the nearby Town Creek Watershed in Lawrence County, Alabama.

Landowners and land users are not bound by law to maintain conservation measures; however, they do sign an agreement with the Soil and Water Conservation District prior to receiving technical assistance. Both application and maintenance decision are recorded in the conservation plan. Cooperators with Soil and Water Conservation Districts have a good record of living up to their agreements.

3. Comment: In the PLANNED PROJECT section it is stated that there is a "lack of adequate soil surveys in Wayne County. What assurance can be given that the recommended stream structures will hold water as proposed in view of this lack of information?"

   Response: Onsite geologic investigations by Soil Conservation Service geologist provided the basis for determining if sites will hold water.

4. Comment: In the PLANNED PROJECT section "reference is made to "170 acres of wildlife land". Where is this acreage located?"

   Response: Most of the watershed acreage could be considered as "wildlife land". However, the 170 acres refers to that land specifically set aside and managed for upland game. This usually consist of supplemental food plots of up to one-half acre on individual land units throughout the watershed.

5. Comment: In reference to critical areas in the PLANNED PROJECT section, Land Treatment Measures subsection, "TWRA recommends the immediate correction of these sediment/siltation sources. As a general overview of the EIS, it would appear that these areas along with runoff are the major sources for most of the watershed problems. What assurance can be given that maintenance will be continued?"

Response: Critical areas will be treated prior to doing structural work. At least 75 percent of the critical area above each structure must be treated before SCS will enter into a project agreement for construction of structures. The watershed sponsors must sign an operation and maintenance agreement for critical areas prior to their treatment. The watershed sponsors may enter into agreements with individual landowners for maintenance of treated critical areas on their land, but this does not relieve the sponsors of their operation and maintenance responsibilities.

6. Comment: Field borders and wildlife food plots as described in the PLANNED PROJECT section, Land Treatment Measures subsection, "are best utilized by wildlife when protected from grazing by cattle or similar impacts. What protection will be afforded to such areas and who will provide and maintain the areas to insure their best value as habitat (food, shelter, and travel lanes) for wildlife? Protection of such areas becomes more important as land uses are changed to uses detrimentally affecting terrestrial wildlife habitat."

Response: Biologists with the SCS are responsible for developing specifications for field borders and other wildlife practices. Specifications provide for adequate protection from grazing and other management items that are necessary for practices to function properly.

7. Comment: The installation of drainage field ditches as described in the PLANNED PROJECT section, Land Treatment Measures subsection, "would be best applied to those existing croplands with low areas which retain surface waters for an extended period of time. However, TWRA would question as a part of this project the ditching of those areas classified as swamps or permanent wet areas. Such areas provide a type of important wildlife habitat which is being lost at an alarming rate. In addition to wildlife habitat, swamps provide a filtering system for removing silt, pesticides and other pollutants from surface runoff."

Response: Technical assistance will not be provided for the installation of on-farm drainage on areas classified as either swamps or permanent wetlands. Farm drainage will be mainly on cropland areas that are damaged by surface or subsurface water. A small amount of drainage will be applied to improve the quality and quantity of pastures.

8. Comment: "Tree plantings should include hardwoods and softwoods distributed according to site capabilities and in a checkerboard

pattern rather than in large blocks. This distribution will provide valuable "edge" and substantially improve wildlife habitat. Forest management plans and other land treatment plans should reflect wildlife values as suggested by the State fish and wildlife management agencies. What guidelines will be followed when removing "cull and inferior trees"? An adequate number of den trees should be left as well as maintaining a diversified habitat of several tree species."

Response: The Alabama Forestry Commission and the Tennessee Division of Forestry will administer the forestry program. Multiple use-substained yields guides for treatment will be followed when removing cull and inferior trees.

9. Comment: "What guidelines will the sponsors be given for the operation of water level control gates?"

Response: Established SCS guidelines on waterfowl and wildlife management will be utilized. Assistance will be requested from state and federal agencies with wildlife and waterfowl management responsibilities as deemed appropriate.

10. Comment Summary: What food will be available for wildlife and waterfowl at the sites where water level control gates will be installed?

Response: Intensity of management will influence foods that will be available for waterfowl. Proper water level manipulation will encourage such plants as barnyard grass and smartweeds. Exposed mud flats will be planted in corn, soybeans, millet, buckwheat, grain sorghum or other recommended crops.

11. Comment: What criteria were used to specifically recognize structures for wildlife and waterfowl.

Response: Site selection was based on interest expressed by landowners and sponsors coupled with the physical characteristics of the site. The area of soil exposed with a 2-4 foot water draw down was a major influencing factor. Recommendations were also solicited from the U. S. Fish and Wildlife Service and Alabama Department of Conservation and Natural Resources.

12. Comment: "Why were cool water outlets not included in all of the structures?"

Response: A meeting was held February 13, 1970 to discuss fish and wildlife mitigation measures to be incorporated into the project.

This meeting was attended by biologists representing Alabama Department of Conservation, Bureau of Sport Fisheries and Wildlife, and SCS. Resulting from this meeting it was determined that only Sites Nos. 11 and 21 were best suited for cool water inlets.

After further discussion with SCS Biologists in Tennessee, the decision was made to incorporate cool water inlets in all structures in Tennessee, and that after studying their effects on fisheries they might be installed during the operation phase on all sites if proven beneficial.

13. Comment: "What will be the disposition of materials from shoreline deepening if the material is not needed for structural embankments?"

Response: The material in excess of that needed for embankment fill will be shaped along the shoreline or used for construction of earth ramps extending into the reservoir.

14. Comment: "One SCS technique for controlling erosion from critical areas involves the construction of 'brush dams'. Is this not a viable use of brush from structure site preparation rather than burning or burying? Given the choice of disposal, on-site burning would be the choice of most contractors."

Response: The use of "brush dams" for erosion control is applicable only to gully erosion control. The 57 critical areas in the watershed consists of 15 gullies and borrow pits and 42 roadbank problems. Since there are only 15 locations scattered throughout the watershed the use of brush dams would not be feasible due to hauling distance from construction sites.

15. Comment: In the PROJECT PURPOSES AND GOALS section, Floodwater Retarding Structures subsection, "reference is made to incidental recreation around FRS. Would this recreational opportunity be for public or for personal use of the landowner involved at a specific site? What assurance can SCS give that even with adequate sanitary facilities public recreation would be available?"

Response: The proposed 19 FRS are designed for flood prevention and sediment control. All public uses will be prohibited by the sponsors as stated in the EIS. No incidental recreation benefits were claimed for project justification (see appendix A for project benefits). Reference to incidental recreation in the EIS has been removed.

16. Comment: "Channel work should not be attempted until critical areas and other sediment/silt sources are stabilized. Such activity

should follow the construction and evaluation of floodwater control structures. Given the protection of the 19 structures, an evaluation of the watershed should determine if normal streamflows are moving out obstructive bedload deposits permitting runoff with a minimum of flooding conditions. As noted previously, TWRA has an interest in downstream alterations as they might affect fish movements from Alabama into Tennessee."

Response: Critical areas will be treated prior to channel modification. The sequence of construction will generally be construction of the FRS followed by the channel work. The channel work may, however, be installed when all the structures upstream from the work have been constructed.

The mainstreams in Cypress Creek Watershed where channel work is planned are clogged with a large volume of debris and bedload material. Unless this material is removed mechanically it will eventually move downstream into Pickwick Reservoir. The channel work will follow the existing alignment except for the 0.6 miles of new channel excavation. After the channel work is completed and several rains have occurred the streams are expected to form their own pools and riffles.

17. Comment: "Appendix C, a map showing locations of structures and channel work, does not indicate the channel work on Dulin Branch."

Response: Close examination of the project map reveals bedload removal work on Dulin Branch from station 418+00 to 437+00. The blue dashed line is obscured by the Alabama-Tennessee State Line. Clarity was lost when the map was reduced from a large scale down to a small scale for inclusion in the EIS.

18. Comment: "Dulin Branch was modified by man in 1954 and is referenced now as being partially or completely clogged with gravel. What assurance can be given that if cleared now it will not be clogged again in the next 20 years?"

Response: FRS No. 7 will be constructed on Dulin Branch about 2,000 feet upstream of the planned channel work. This dam will control sediment from 2,212 acres of the 2,551 acres of drainage area at the channel location. This only leaves 339 acres of uncontrolled drainage area to contribute sediment to the stream. Since most of the sediment will be trapped by the FRS, the stream should not become clogged with sediment during the life of the project.

19. Comment: "Rock ledges, shoals, gravel bars, and logs favorably contribute to the fish habitat of Dulin Branch. Their removal is a detrimental impact to the aquatic habitat."

    Response: The stream is clogged with bedload material to the extent that existing travelways, shoals, and logs cannot be used as fishery habitat.

20. Comment: "Spoil from the channel work should not be placed in sloughs or oxbows capable of supporting fish and other aquatic life. Its placement would be best in sites outside of the flood plain to prevent further encroachment on the floodwater storage area."

    Response: Spoil sites will be selected that will not destroy existing fishery habitat. Spoil sites will be shaped and vegetated and will have little influence on floodwater storage areas.

21. Comment: "Riprap should be of large size to provide habitat for small fish and other organisms. This is especially true for channel side slopes below base flow."

    Response: We agree with the suggestion; however, sufficient voids between the larger stones will have to be filled with smaller stones to keep the bank material from filtering through. The final stone size for the riprap has not been selected.

22. Comment: "Who will be responsible for vegetation maintenance associated with structural measures after the 3-year period following completion of the structures?"

    Response: The sponsoring local organizations will operate and maintain the structural measures as is pointed out in the PLANNED PROJECT section, Operation and Maintenance subsection.

23. Comment Summary: What assurance can be given that maintenance would continue after the 3-year installation period?

    Response: Before project installation an O&M agreement between SCS and the watershed sponsors will be signed. This agreement assigns the responsibility for O&M to the sponsors for the life of the project. See PLANNED PROJECT section, Operation and Maintenance subsection.

24. Comment Summary: In the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Surface Water Resources subsection reference is made that no wetlands are in the watershed. However, vegetation and area descriptions would suggest that there are some characteristics of Wetland Types 1, 2, or 3. This item should be reevaluated.

Response: The proper changes have been made.

25. Comment: In the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Game Resources subsection, "reference to northern limit of fishing should include fair fishing in the Tennessee portion of watershed for black bass, rockbass, sunfish, and catfish."

Response: The suggested change has been made.

26. Comment: "Deer hunting is not classified as negligible in the Tennessee portion of the watershed." (WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Game Resources subsection)

Response: The rating has been changed.

27. Comment: "Some mention should be made of the aesthetic quality of game animals, and not relate their value for consumptive use only." (WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Game Resources subsection)

Response: This comment has been incorporated into the subsection on Game Resources.

28. Comment: "The section on endangered/threatened species should be reevaluated to reflect the current status of various species."

Response: Suggested changes have been made.

29. Comment: "What other endangered/threatened species are noted in Boschung's report?"

Response: Other rare and endangered organisms listed as rare or endangered in Boschung's report include the following:

Accipiter striatus - Sharp-skinned hawk
Accipiter cooperii - Cooper's hawk
Aquila chrysaetos - Golden eagle
Haliaeetus leucocephalus - Bald eagle
Pandion haliaetus - Osprey
Falco peregrinus - Peregrine falcon
Thryomanes bewickii - Bewick's wren
Sorex longirostris longirostris - Southeastern shrew
Lasiurus cinereus cinereus - Hoary bat
Myotis sodalis - Indiana myotis

The project, as planned, will not affect the population of any organism on the above list.

30. Comment: "Proper recognition of outdoor recreation is not made in the section on recreational resources."

    Response: Changes have been made as recommended.

31. Comment: "It should be noted that stream recreation would be impacted as streams are dammed with FRS and channel alterations are made."

    Response: Channel work is planned on 9 percent of the existing streams. This percentage of total streams should have little effect on stream recreation. In addition, the FRS will be installed on the intermittent portion of Cypress Creek tributaries except for Site No. 20. Therefore, it would be unlikely that stream recreation would be adversely affected.

32. Comment: "What is the relationship of the actual flood damage occurring each year with that suggested by a "100-year frequency flood" area of 10,321 acres?"

    Response: The watershed project is analyzed to determine its economic feasibility with a 100-year life expectancy. Floods up to a 100-year frequency flood are used to estimate damages, therefore, the 100-year flood plain of 10,321 acres is established. An explanation of the actual flood damages occurring each year is given in the WATER AND RELATED LAND RESOURCE PROBLEMS section, Floodwater Damage subsection.

33. Comment: "What percent of the corn, cotton, soybeans, pastureland, forest land, and idle land is being damaged each year (1- and 2-year flood)?"

    Response: The information in this response is an estimate based on land use patterns in the flood plain. About 40 percent of the corn acreage, 2 percent of the cotton, and 10 percent of the soybeans are damaged by the 1- and 2-year floods. About 50 percent of the pastureland and 30 percent of idle and other are damaged by these same floods.

34. Comment: "How much of the channel damage is the result of land-owners (-users) removing the protective cover?"

    Response: Assuming the statement "removing protective cover" refers to channel banks, this is not a significant cause of the problem.

35. Comment: "How are the landowners disposing of brush removed from along the channels?"

Response: No response required because land users are not removing cover from channel banks. This is not a common practice in the area.

36. Comment: "What influences do bridges and culverts in the watershed have on permitting high flows to pass without being obstructed and flooding the adjacent flood plain?" (See WATER AND RELATED LAND RESOURCES section, Floodwater Damage subsection.)

Response: Bridges and culverts are designed to carry from a 5 year up to a 100 year storm depending on their location. Federal and state highways usually have bridges and culverts designed to carry from a 25 to over a 100 year storm whereas county road bridges and culverts may only be designed to carry a 1 year to 5 year storm. In locations where the bridge or culvert will not carry large storm flows the bridge acts similar to a floodwater retarding structure. Water backs up onto the flood plain on the upstream side of the road with the downstream flood plain being protected. Since the downstream flood plain is flooded less with the culvert or bridge to protect it and the upstream flood plain is flooded more, then the two sides tend to offset each other with no net effect.

37. Comment Summary: The main problem in the watershed is poor land use and management. The main thrust of the project should be controlling erosion. Channel modification should follow accelerated land treatment and FRS.

Response: Poor land use and management is a significant problem and therefore land treatment is the first proposal and first increment in analysis of program effects. Critical area stabilization and other land treatment must be well under way before associated FRS are built. (For additional information, see response to Comment No. 16.)

38. Comment: Two additional recreation areas might be included in the recreational resources available in the watershed.

Response: Changes have been made as recommended in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Recreational Resources subsection.

39. Comment: "The presence of recreational facilities on the Tennessee River and its lakes does not remove the need for small stream public recreation."

Response: Noted.

40. Comment: "Plant and Animal Problems indicate no significant changes in plant communities. This evaluation is questionable when an increase of 9.7 percent in cropland, 5.6 percent increase in pastureland, 23.9 percent decrease in forest land, 100 percent decrease in idle land and no change in miscellaneous is shown. All percentages are based upon comparisons with and without the project within the 10,321 acre flood plain. Depending on where these changes occur, impacts could be substantial."

Response: The statement pertaining to plant communities in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section, Plant and Animal Problems subsection is in reference to the current land use changes that are now taking place in the watershed and their effects on communities. Project impacts on the plant communities are discussed in more detail in the ENVIRONMENTAL IMPACT section.

41. Questions directed toward the WATER AND RELATED LAND RESOURCE PROBLEMS section are as follows:

A. Comment Summary: Do "gross sales figures" relate to all farms actually operated as a commercial enterprise?

Response: Yes.

B. Comment: "Is the farm enterprise supplementing other employment or is the reverse true?"

Response: Traditionally, off-farm employment has supplemented farm income. In some areas the reverse is now true. However, for this watershed interviews indicate that watershed residents are supplementing farm income with off-farm employment.

C. Comment: "To what year do the unemployment rates apply?"

Response: The unemployment rates quoted were current in the spring of 1973."

D. Comment: "How will this project provide long-term unemployment relief?"

Response: See ENVIRONMENTAL IMPACT section, Favorable Environmental Impacts subsection, Nos. 22 and 23.

42. Comment Summary: In the ENVIRONMENTAL IMPACT section benefits and losses are based on annual floods or 100-year frequency floods depending on the situation. Does this project as planned, reduce flooding from a 100-year frequency by only 25.4 percent?

Response: Flooding from the 100-year flood will be reduced from 10,321 acres to 7,690 acres or 25.5 percent; however, as discussed in the EIS, average annual acres flooded will be reduced from 14,155 acres to 4,236 acres or 70 percent.

43. Comment: In the ENVIRONMENTAL IMPACT section future yields are displayed. How will this project improve yields and what percent of these crops are affected by various flood categories?

Response: Future without project yields are yields that can be expected to occur with normal increases in farming technology. Future with project yields will occur by allowing farmers to perform farming operations in a more timely manner since flood hazards have been reduced. A frequent case is when farmers delay planting in order to avoid spring flooding. In addition the protection will induce farmers to increase their production inputs such as fertilizer and seed which should result in increased production. (For additional information, see response to Comment No. 33.)

44. Comment: "The loss of forest land is more than a 'minor effect'. Wood ducks also nest along portions of streams in the watershed. What management guidelines will be used to retain the important mast and den trees?"

Response: See response to Comment No. 8.

45. Comment: "Will land treatment measures reduce sheet erosion by only 9 percent?"

Response: The predicted reduction is based on conservation land treatment that can be installed and brought to full effectiveness by a voluntary program during the installation period. Average, per-acre, reduction in erosion is predicted to be small because the forest land (68 percent of the watershed) already has a low erosion rate and, therefore, dramatic reduction in per-acre erosion is practically impossible. It would be noted, in this context, that land treatment will reduce total annual erosion by more than 68,000 tons.

46. Comment: The ENVIRONMENTAL IMPACT section shows structural measures benefiting 10,321 acres. "How will structural measures benefit 10,321 acres if 7,700 acres would still be flooded with a 100-year frequency flood?"

Response: An array of storm frequencies, ranging from .167 to 100 years was used in the evaluation. The project proposal will

eliminate flooding from a given number of acres for any given frequency storm. Using the 100 year as questioned in the comment the flood free acreage is 2,621. A 2 year storm will be reduced from 7,010 acres to 3,100 acres. See ENVIRONMENTAL IMPACT section Flood Prevention, Erosion, and Sediment subsection.

47. Comment: "How would cropland be reduced when an increase of 9.7 percent for cropland, 5.6 percent increase for pastureland, 23.9 percent decrease for forest land, and 100 percent decrease for idle land is shown. The potential is increased pesticide problems rather than reduced since there is more cropland and a landowner desire to increase farming intensity."

    Response: See response to Comment No. 7, EPA.

48. Comment: "Although the aesthetic appeal of some portions of streams might be improved, some structural measures on streams can detract from this appeal as suggested by the "Academy of Natural Science" while reviewing a similar watershed project."

    Response: The FRS should detract little, if any, from the aesthetic appeal of the streams in this watershed considering the fact that only one structure will be constructed on a perennial stream.

49. Comment: "What assurances can be made to ensure public access to water areas for nature study?"

    Response: No assurances can be made other than those from sponsors or private landowners.

50. Comment Summary: Table 3A in the PLANNED PROJECT section, Channel Work subsection indicates that six streams flow at all times except during extreme drought conditions. Would this characteristic contradict the comment of "all but one . . . intermittent streams" in the ENVIRONMENTAL IMPACT section, Fish and Wildlife and Recreation subsection?

    Response: The statement in the ENVIRONMENTAL IMPACT section, Fish and Wildlife and Recreation subsection refers to the type of stream-flow at the FRS locations. The structures are located on the upper reaches of streams where the streams are intermittent. The statement in the PLANNED PROJECT section, Channel Work subsection refers to the flow conditions where channel work is planned. This is downstream from the FRS sites where the streams are classified as perennial.

51. Comment Summary: The current status of the endangered/threatened species in the ENVIRONMENTAL IMPACT section should be checked.

    Response: The status has been checked as suggested and the necessary changes made.

52. Comment: "Stream length is not as serious as removing fish shelter of streamside vegetation resulting from the project or future landowner activity." (ENVIRONMENTAL IMPACT section)

Response: Concur. Loss of both stream length and riparian vegetation can be detrimental effects of stream alteration. Loss of streamside plant cover probably has more serious impacts, especially for the first 10-15 years following channel work. The ENVIRONMENTAL IMPACT section, Adverse Environmental Effects subsection has been changed.

53. Comment: "What were the watershed projects studied by University of Georgia which provided no significant adverse or beneficial ecological impacts? List of references lacking."

Response: The list of references were inadvertantly omitted from the ENVIRONMENTAL IMPACT section. They have been included in the final document.

54. Comment: "The reduction of silt in the streams and the application of certain land management programs are certainly beneficial; however, without certain long-term maintenance their benefits will not replace the potential habitat lost by various structural measures."

Response: See response to Comment No. 2.

55. Comment: In the ENVIRONMENTAL IMPACT section "it would appear that some of the suggested economic and social benefits resulting from this project are overly optimistic. What have been the documented benefits from other projects?"

Response: Several universities have initiated studies in this area. Most results show favorable short-term effects but long-range effects cannot be measured without relying heavily on projections. SCS projections were based on knowledge of the local economy in the area and the multiplier effect caused by the introduction of several million dollars into the local economy. See Agricultural Experiment Station, Bulletin 453, January 1974, The Economy of Talladega County, Alabama, Auburn University, Auburn, Alabama. Research for this publication came from the Cheaha Creek Watershed in Talladega County, Alabama.

56. Comment: In the ENVIRONMENTAL IMPACT section, "the addition of 5 acres of field border vegetation is insignificant if the entire flood plain of 10,321 acres is considered."

Response: No response required.

57. Comment: "Will conservation land treatment measures adequately protect the land with the landowners intent to convert more of the flood plain into cropland and pasture? Protection with more intensive farming methods?" (ENVIRONMENTAL IMPACT section, Favorable Environmental Impacts subsection, No. 4)

Response: Conservation land treatment measures will adequately treat the land on which they are installed. More cropland is expected on the flood plain; however, cropland is expected to decrease by about 700 acres for the entire watershed. Pastures and haylands are expected to increase by about 2,300 acres in the entire watershed. The average annual soil losses for much of the cropland on uplands will exceed established tolerance rates. However, it is expected that about 6,000 acres of cropland will be adequately treated during the installation period. Pastures and haylands are much more effective in controlling runoff and erosion than croplands. Most of the pastures and haylands in the watershed will be adequately treated or protected by the end of the installation period.

58. Comment: "There will be a higher probability of fertilizer and pesticides entering the streams considering the above" comment summary. (ENVIRONMENTAL IMPACT section, Favorable Environmental Impacts subsection, Nos. 5 and 8)

Response: Fertilizers and pesticides move from the soil to streams mostly by soil erosion and surface runoff. Erosion and runoff are much higher on sloping upland soils than on the nearby level flood plain soils. The project will result in less cropland on the sloping upland soils, less total cropland, and accelerated application of conservation practices that are effective in reducing erosion and runoff. Fertilizers and pesticides entering the streams should be slightly reduced by the project.

59. Comment: In the ENVIRONMENTAL IMPACT section, Favorable Environmental Impacts subsection, "Nos. 12, 13, 14, 15, and 16 may be true with annual floods, but floods of 2-year frequency to 100-year frequency will not result in reduction of damages to the degree stated."

Response: See response to Comment No. 2 of the Alabama Department of Conservation and Natural Resources.

60. Comment: "What assurances can be given that the 78 ponds proposed in conservation land treatment will be anything more than unmanaged bodies of water? The quality of habitat is proportional to the applied management." (ENVIRONMENTAL IMPACT section, Favorable Environmental Impacts subsection, No. 20).

Response: SCS records show that 27,630 of the 54,318 ponds in Alabama are being properly managed for fish. Most of the remaining ponds are used for watering livestock and not designed for fishing.

61. Comment: "Numbers 21, 22, and 23 are not necessarily favorable environmental impacts - they are more social/well-being spinoffs, the last two being short-term."

Response: Man, being a part of the environment, is affected by the installation of this project. For this point in time Nos. 21, 22, and 23 are favorable environmental impacts especially with the problem of unemployment. Number 22 is not short term. Operation and maintenance will be required for the life of the project. Therefore, these jobs will exist for the 100-year life of the project. Number 23 will exist for the 10-year installation period.

62. Comment: "There would be a permanent loss of vegetation of the type now growing on the 420 acres needed for dams and spillways. The re-vegetation might not be of the same type now growing." (ENVIRONMENTAL IMPACT section, Adverse Environmental Effects subsection, No. 4)

Response: Effect has been clarified.

63. Comment Summary: Adverse Environmental Effects Nos. 5, 6, and 7 are social/well-being spinoffs, not environmental impacts.

Response: Man's environment is affected by the installation of this project, therefore, Nos. 5, 6, and 7 are adverse environmental effects.

64. Comment: "There would be a permanent loss of wildlife of a type now present on construction sites. Some other types (species) might move in after construction, but would not be the same species." (ENVIRONMENTAL IMPACT section, Adverse Environmental Effects subsection)

Response: There would not necessarily be a loss of wildlife on construction sites, only a change in habitat type. This will tend to create more habitat diversity and "edge effect".

65. Comment: "The loss (potential or actual) of some previously recognized endangered or threatened species was not included in this section of Adverse Environmental Effects. This would definitely be an adverse impact if an endangered species or its habitat were adversely affected."

Response: Suggested changes have been made.

66. Comment: "A multi-agency study was suggested and preliminary plans were formulated in 1971 to determine the effects of channelization and other watershed development on wildlife habitat and populations in the Cypress Creek Watershed. This study was to involve representatives of SCS, Fish and Wildlife Service, Alabama Department of Conservation and Tennessee Wildlife Resources Agency. What are the results of this study, and if satisfactory progress has been made, how do the study conclusions compare with the objectives of this proposed project?"

Response: This study was not implemented; however, other studies were made as described in the EIS. Also, further studies on the slackwater darter are ongoing through cooperative agreement with the University of Alabama.

67. Comment: "Of concern to TWRA is the lack of, input from various agencies in Tennessee. This would include TWRA which has current information on fish and wildlife populations and recreational use. The publication, An Appraisal of Potentials for Outdoor Recreation - Wayne County, is an example and should be reviewed and referenced. If wildlife habitat improvement is to be a part of this project, TWRA must be represented in the early stages as well as in the later stages."

Response: The Tennessee State Game Agency, the Alabama Department of Conservation and Natural Resources, and the U. S. Fish and Wildlife Service were contacted during the early stages and throughout the planning process of this project and had opportunity to provide input.

68. Comment: "The potential for changes in the populations and/or habitat for mosquitoes and other arthropods of importance to human health and recreation is not discussed. The "benefits" claimed for recreation and social well-being could be overly optimistic if annoying insects reach high population levels. This matter should be included in this statement."

Response: No benefits for project justification were claimed from recreation. However, effects on recreation and social well-being were displayed. (See TVA, Chattanooga, response to Comments Nos. 26 and 27.)

Agricultural Experiment Station, University of Tennessee

Comment: "We have examined the Draft Environmental Impact Statement for Cypress Creek Watershed, for Lauderdale County, Alabama and Wayne County, Tennessee and have no comments."

Response: Noted.

Alabama Archaeological Society

Comment Summary: The Society cannot emphasize too strongly the necessity to watch for additional archaeological sites as land clearing and soil removal progresses. It is important that an archaeologist has the opportunity to visit these sites before they are destroyed by land altering operations. We wish to compliment you for compiling very comprehensive reports for this watershed project. I am sure the Soil Conservation Service realizes the importance of recording the archaeological sites and will continue to call upon the professional archaeologists for advice and consultation.

Response: Noted.

Tennessee Chapter - The Wildlife Society

1. Comment: "While summarizing the flood control project, the statement notes landowner intentions of expanding the cropland and pasture acreage and more intensively farming existing acreage. Within the body of the report, the statement discussed the present erosion/siltation problems and current and past farming practices as they relate to these problems."

   Based upon above comments and the fact that SCS does not have the authority for making final decisions on land management activities, it would appear that anticipated land use practices would negate many of the potential gains attributed to this project. This result would be at the expense of several hundreds of acres of potential wildlife habitat, both terrestrial and aquatic. The acreage noted as being improved and/or developed for wildlife will in no way replace the acreage lost as a direct result of this project or the secondary losses resulting from additional encroachment on the flood plain."

   Response: A table showing present and expected future land use for the entire watershed was inadvertently omitted from the draft, but has been included in the final statement. For the entire watershed,

cropland is expected to decrease and pasture is expected to increase. The opposite is expected for flood plain use. Forest land is expected to decrease on the flood plain and in the entire watershed.

It is assumed that the negated benefit referred to in the comment is the expected loss of forest land. Forest land is expected to decrease by about 1,500 acres, of which 536 acres is flood plain forest land. We agree that loss of forest land will result in reduced habitat for some species of wildlife; however, some species, such as dove, will benefit by more open land. As stated in the statement, the present land use trend for the watershed is toward less forest land. Forest land, in the entire watershed, is expected to decrease without the project.

2. Comment: "It should be noted that nearly 1,400 acres in Wayne County are presently under the CAP, a program offering monetary consideration for not planting various lands."

   Response: See response to Comment No. 1, TWRA.

3. Comment: "Assuming accelerated conservation land treatment measures are initiated, what assurance can be offered that this activity would be continously monitored and maintained? One stream is noted as having been treated by man several years ago. However, this stream is also currently noted as needing new treatment to provide unobstructed streamflows. What assurance can be given that the improved streams will not become clogged with sediment in future years?"

   Response: Conservation land treatment practices are not monitored on a continuous basis; however, a very important phase of the Soil and Water Conservation District program includes technical assistance for services to cooperators for maintenance of conservation practices. Conservation measures are observed by SCS employees and landowners during routine servicing of conservation plans. Follow-up technical assistance will be scheduled as needed for practice maintenance.

   Watershed sponsors will be responsible for maintenance of all project structural measures. An operation and maintenance agreement will be executed prior to signing a project agreement for construction. Land treatment practices will be maintained by landowners and land users.

4. Comment: "Reference is made to the provision of public recreation with the completion of this project. However, with the landowner

having final responsibility for structures on his land, the recreational opportunity would be of local (personal?) importance only unless public access is provided. Knowledge of landowner attitudes toward public recreation is necessary before the potential of recreation can be recorded as a benefit of the project."

Response: See response to Comment No. 15, TWRA.

5. Comment: "The EIS states that no wetlands, as described by the Fish and Wildlife Service bulletin describing such areas, exists in the project area. However, as noted further on in the report, some swamp areas are characterized by having cattails, sedges and other aquatic-type plants in the area. It is suggested that the conclusion that no wetland areas are present should be reexamined and corrected. Such areas should not be filled with material removed from the stream channels. This suggestion would be applicable to any area providing habitat for fish and other aquatic-associated organisms."

Response: Changes have been made as suggested. Circular 39 which defines various wetland types was issued in 1956 and is presently being used as a guideline in classifying wetlands. There is lack of agreement among professional resource managers as to the application of Circular 39. However, about 75 percent of the 10,321 acre flood plain probably fits the description of Type 1. In addition, there are small, scattered areas (less than 2 acres) of wetlands that collectively total about 100 acres that could be characterized as Type 2.

SCS policy prevents the implementation of projects designed to alter wetlands of Types 3 through 20. Projects involving alterations of wetlands Type 1 or Type 2 are closely reviewed at state, regional, and national levels to assure compliance with appropriate land use planning guidelines and regulations.

6. Comment: "The headwaters of the Cypress Creek Watershed in Tennessee offer more wildlife habitat and public recreation than is generally recognized in the statement."

Response: See response to Comment Nos. 25 and 26, TWRA.

7. Comment: Stream fishing is popular locally and would be referenced as fair for bass, sunfish, rockbass and catfish. Care should be taken when stating the increase of reservoir fishing - such increases would be at the partial expense of stream fishing. In some aspects, substantial reservoir fishing is available now without creating more such habitat at the expense of stream fishing.

Response: Change made as suggested. All but Site No. 20 of the 19 FRS will be located on intermittent streams and will not eliminate any game fishery. Site No. 20 will alter the composition of the existing fishery on that portion of the stream to be inundated. However, the net effect will be an increase in total production of game fish in the reservoir area.

8. Comment: "The section concerning endangered/threatened species should be reevaluated in light of the current status of those species referred to and those species not specifically listed in the statement.....This section should be summarized in the listing of detrimental effects toward the end of the statement."

Response: Changes have been made in the WATERSHED RESOURCES-ENVIRONMENTAL SETTING section.

As viewed by the Tennessee Chapter of The Wildlife Society, this watershed project has the potential for substantially improving the Cypress Creek Watershed with emphasis on the following three comments.

9. Comment: "Accelerated Conservation Land Treatment - such action should emphasize the stabilization of areas subject to erosion and siltation. Descriptions of the flood problems point out the past misuse of the watershed and flood plain which has permitted the stream channels to become clogged with rock and soil materials. Trees, rock ledges and similar materials should be removed only after an appraisal by fisheries biologists of the states and federal government (Fish and Wildlife Service and SCS). Habitat for aquatic life is essential, not only for the stream in question but also for those waterways downstream."

Response: The statement does emphasize the stabilization of areas most subject to erosion. Fifty-seven critical eroding areas are located and designated for treatment. The designated critical areas are the most erosive land in the watershed. Cropland is the second most erosive land. The plan provides for applying conservation practices to 6,000 acres of cropland to the extent that the average annual soil losses are kept within tolerance levels. This amount represents almost nine times as many cropland acres as are presently treated.

10. Comment: "Land treatment should adequately recognize and include in proposed activities inclusions for wildlife habitat development. Such areas must be protected from grazing or similar impacts in order that the areas might attain their full potential. The acreage noted in the statement will in no way mitigate the recognized potential losses."

Response: Wildlife habitat development will receive high priority in the land treatment phase of the program. Wildlife habitat development, as a secondary land use, will be emphasized during the conservation planning phase to encourage conditions that are conducive to wildlife on all land uses. For example, cooperators will be encouraged to; leave den and food trees on land managed for forest products, delay tillage of harvested crop fields for wildlife uses, and perform mowing operations on pastures at times that are least detrimental to wildlife. Specifications for wildlife practices are developed by SCS biologists. The 170 acres of wildlife lands noted in the statement consists of lands developed primarily for wildlife uses. Wildlife developments will be adequately protected from mowing, grazing, and similar impacts.

11. Comment: "The full potential of the watershed project will not be achieved if continued detrimental flood plain development and encroachment is permitted. Protective guidelines to prevent this mismanagement and stream degradation are needed and are recommended. The reductions of sediment and surface runoff noted on the statement should be the minimum amounts accepted. Continued monitoring of the watershed should effectively point out areas where more intensive land management will reduce further that area's detrimental environmental impacts, especially within stream channels."

Response: Conservation land treatment measures, FRS, and treatment of 57 critical areas will provide protection against erosion, flooding and sediment. The flood plain will be developed for agricultural purposes as mentioned in the EIS. There are no provisions by which SCS can limit the encroachment of the flood plain by residential development. However, SCS will provide requested technical assistance in regards to flood plain development.

12. Comment: Based upon the information discussed in this statement, the Tennessee Chapter of The Wildlife Society recommends the following alternatives in order of preference.

1st: Accelerated Conservation Land Treatment Measures and Flood Plain Zoning

2nd: Accelerated Conservation Land Treatment Measures

3rd: Accelerated Conservation Land Treatment Measures and 19 Structures"

Response: No response required.

13. Comment: "The Chapter strongly suggests that FRS not be installed until documentation is made to indicate that land conservation treatment measures are not favorably stabilizing the watershed. Streamside zoning, directed toward preventing encroachment upon the flood hazard area, should provide wildlife habitat while providing a buffer strip between agricultural operations and the streams."

Response: A study of the suggested alternatives indicated that conservation land treatment would not meet project objectives. The SCS requires that conservation plans be developed on at least 50 percent of the land above each FRS prior to entering into a project agreement for construction. At least 75 percent of all critical eroding areas above each structure must be treated also. Conservation land treatment will account for about 13 percent of the anticipated sediment reduction. FRS will be necessary to obtain project objectives.

Neither the sponsors or the SCS have zoning authority. SCS will require that berms, spoil and other areas disturbed during channel work be established in grasses and legumes. Trees will be planted at selected locations along the channel work areas. These areas will provide a narrow buffer strip between agricultural operations and the streams. These areas will provide travel lanes and some food and shelter for wildlife. SCS and District Supervisors recognize the value of tree and grass buffer strips adjacent to streams. Landowners and land users will be encouraged to establish and maintain buffer strips, as needed, along streams where no channel work is planned.

14. Comment: "Stream channel work should follow the installation and evaluation of FRS. It has been shown that some watersheds responded favorably when land treatment and structural work prevented new siltation while streamflows removed existing obstructing bedload. Streams treated in this manner made their own natural meanders, pools, and riffles without man's influence."

Response: See response to Comment No. 16, TWRA.

Bob Truett, Birmingham, Alabama

"The following comments are for the record on the Cypress Creek Watershed project and are based on the Draft Environmental Impact Statement dated December 1974."

Comment: "I am very much opposed to 'channel work' planned for 14.4 miles of major streams in this project. It is well known and documented by extensive studies that stream channelization as planned for this project destroys wildlife habitat, causes damage to streambanks and their biological communities, lowers water tables, and aggravates downstream flooding conditions. Channelization of streams should not be considered as an appropriate technique in watershed development."

Response: The draft and final EIS provide full disclosure of the impacts the proposed project will have to wildlife habitat, streambanks, biological communities, water tables, and downstream flooding conditions.

LIST OF APPENDICES

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Letters of Comment Received on the Draft Environmental Statement.

Appendix C - Project Map

Appendix D - Typical Sections of Channel Work

Appendix E - Soil Association Map

Appendix F - Land Use Map

Appendix G - Critically Eroding Areas

Appendix H - Ground Water Availability Map and Legend

Appendix I - Geologic Map with Explanation

Appendix J - Location of Fish Collection Sites

Appendix K - Section of Typical Floodwater Retarding Structure (Single-stage Riser)

Appendix L - Section of Typical Floodwater Retarding Structure (Two-stage Riser)

Appendix M - Typical Reinforced Concrete Drop Spillway

Approved By W. B. Lingle Date 3/3/76

W. B. Lingle
State Conservationist
Soil Conservation Service

APPENDIX A - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Cypress Creek Watershed, Alabama and Tennessee

(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS 1/							Average Annual Cost 3/	Benefit-Cost Ratio
	Damage Reduction	More Intensive Land Use	Changed Land Use	Land Use and Development	Redevelopment	Secondary	Total		
FRS 1,2,3,5,6,7,8, 9,10,11,12,13,15,16, 17,18,19,20,21, and channel work	289,150 2/	127,100	77,250	44,050	111,100	284,400	933,050	443,250	2.1:1.0
Project Administration								60,300	
GRAND TOTAL	289,150	127,100	77,250	44,050	111,100	284,400	933,050	503,550	1.9:1.0

1/ Price base: crop and pasture benefits current normalized prices (October 1974), other benefits 1975 prices.

2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $14,200 annually.

3/ Installation cost 1975 prices amortized for 100 years at 6 1/8 percent, O&M 1975 prices.

January 1976

APPENDIX B

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

15 MAY 1975

Control No. 06 - 98247
Referred to: SCS
Date: MAY 23 1975

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the State Conservationist for Alabama, by letter dated 28 March 1975, requested the views of the Secretary of the Army on the Watershed Work Plan and Draft Environmental Impact Statement for Cypress Creek Watershed, Alabama and Tennessee.

We have reviewed the work plan and foresee no conflict with any projects or current proposals of this Department.

The draft environmental impact statement is considered

Sincerely,

Charles R. Ford

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202

IN REPLY REFER TO
ORNOP-W

29 May 1975

Mr. W. B. Lingle
Soil Conservation Service
US Department of Agriculture
PO Box 311
Auburn, Alabama 36380

RE: Draft Work Plan and Environmental Impact Statement for the Cypress Creek Watershed

Dear Mr. Lingle:

We have reviewed the Draft Watershed Work Plan to determine Department of the Army Permit requirements applicable to the proposed project under Sections 9 and 10 of the River and Harbor Act of 1899 and Section 404 of the Federal Water Pollution Control Act Amendments of 1972 (FWPCA).

In the past, jurisdiction under these statutes has been exercised in the navigable waters of the United States. However, in Natural Resources Defense Council v. Calloway, Civil Action No. 74-1242 (D.C.D.C. March 27, 1975) the Corps of Engineers was ordered to extend permit jurisdiction under Section 404 of the FWPCA to the "waters of the United States." Accordingly, in the 6 May 1975 issue of the Federal Register, the Corps of Engineers published proposed revised permit regulations which attempt to administratively define "waters of the United States." I am enclosing a copy of the four alternative proposals which were published.

We currently exercise jurisdiction over Cypress Creek from mouth to Mile 17.6 and over Little Cypress Creek from mouth to Mile 8.0. Therefore, any activity planned within these limits, below ordinary high water, will require a Department of the Army permit. Depending on the final decision regarding the four alternative permitting procedures for Section 404, activities on water bodies other than navigable waters within the Cypress Creek Watershed may require permits. Applications for disposal of dredged or fill material in waters other than navigable waters of the United States under Section 404 will be accepted but not processed by Corps of Engineers until final permitting procedures have been published in the Federal Register.

We have reviewed the Draft Environmental Impact Statement and have no comments.

The opportunity to comment on this proposal is appreciated. If you have questions concerning Corps of Engineers requirements, please contact Waterways Management Branch or telephone (615) 749-5181.

Sincerely yours,

HOWARD BOATMAN
Chief, Operations Division

1 Encl
Alternative Proposals

Alternative 1 - Under this alternative the Department of the Army's regulatory jurisdiction over the disposal of dredged or fill material would extend to virtually every coastal and inland artificial or natural waterbody. This would include all navigable waters of the United States, as discussed above, up to their headwaters and all tributaries of navigable waters of the United States up to their headwaters. It would also include all natural or artificial interstate waters and all natural or artificial intrastate lakes, rivers and streams utilized by interstate travelers for recreational or other pruposes, utilized for the removal of fish sold in interstate commerce, utilized for industrial purposes by industries in interstate commerce, or used to produce or aid in the production of agricultural commodities sold or transported in interstate commerce. Jurisdiction over these particular waters would extend to the ordinary high water mark (which

is that line impressed on land adjacent to the waterbody established by physical characteristics such as erosion, shelving, changes in the character of the soil, destruction of terrestrial vegetation or its inability to grow, the presence of litter and debris, or other appropriate means which consider the characteristics of the surrounding area) or to the "aquatic vegetation line", whichever extends further shoreward. The "aquatic vegetation line" is the line beyond which plants which depend on periodic inundation of the waterbody for growth, are unable to thrive.

Army jurisdiction under this Alternative would also extend to all coastal, riverine, estuarine and lake waters subject to the ebb and flow of the tide shoreward to the "aquatic vegetation line" or "mean monthly high tide line", whichever extend further shoreward. The "mean monthly high tide line" is the line on shore established by averaging the highest tide which occurs each month over an 18.6 year period.

The effect of this alternative, therefore, would be to regulate all disposal of dredged or fill material in virtually every wetland contiguous to coastal waters, rivers, estuaries, lakes, streams, and artificial waters regardless of whether those wetlands are regularly or only periodically inundated by salt water, brackish water, or fresh water.

Alternative 1 proposes a Federal regulatory program over the disposal of dredged or fill material in all these waters similar to the program which is presently administered by the Corps of Engineers in navigable waters of the United States. It recognizes that State certifications and authorizations also may be required for these same types of activities,

and indicates that as a matter of policy Department of the Army permits will be denied when these State authorizations and certifications have been denied. However, in the opposite case (where State authorization or certification has been granted), it contemplates that the Army permit may still be denied even though a favorable State decision has already been made on the proposed action.

As a general rule, the average Department of the Army permit now requires about four months to process provided the proposed activity is minor in nature and noncontroversial. This time period includes a 30-day public notice period as well as the additional period of time required to evaluate the various comments received from this public notice. The comments include those received from the various State and Federal agencies including the Environmental Protection Agency, the Bureau of Sport Fisheries and Wildlife of the Department of the Interior, the National Marine Fisheries Service of the Department of Commerce, the Council on Environmental Quality and the Advisory Council on Historic Preservation, as mandated by Federal legislation such as the National Environmental Policy Act, the Fish and Wildlife Coordination Act, the Marine Protection, Research and Sanctuaries Act of 1972, the National Historic Preservation Act, the Endangered Species Act, and the FWPCA. This time period is further increased if a public hearing is held as required by Section 404 of the FWPCA, and may be even further increased to a period of well over a year if an environmental impact statement must be prepared following a conclusion that the proposed disposal of dredged or fill material, if authorized, will cause a significant impact to the environment.

Applications for Section 404 permits would be processed under Alternative I through the issuance of a Public Notice, but would not be processed further until all required State authorizations and certifications have been obtained by the applicant and furnished to the District Engineer. Thereafter, the processing of the permit would proceed to a conclusion, and a decision would be made to issue or deny the permit. The outcome of this decision will be based on the application of guidelines which have been developed by the Administrator, Environmental Protection Agency in conjunction with the Secretary of the Army. These guidelines are also being publishe for public comment in this issue of the Federal Register. Accordingly, the public is requested to review all alternatives, in conjunction with these guidelines, in order to comprehend the full impact of each of these alternatives.

Alternative 2. This alternative contemplates a more limited definition of "waters of the United States." With respect to coastal waters, it includes all such waters subject to the ebb and flow of the tide shoreward to the mean high water mark (mean higher high water mark on the west coast) or the salt water vegetation line, whichever extends further shoreward. The salt water vegetation line is the line beyond which plant species, which depend on salinity conditions for vigorous growth and survival, do not thrive. The mean high water mark (or mean higher high water mark on the West Coast), on the other hand, is the line on shore established by the average of all high tides preferably over a period of 18.6 years. However, in the absence of such tidal data, less precise methods will be used such as physical markings or a comparison of the area in question with areas having similar physical characteristics for which tidal data is already available.

Jurisdiction over inland waters under this limited definition would include all navigable waters of the United States up to their headwaters and all primary tributaries of such waters up to their headwaters. In addition, no Section 404 permits would be required for the discharge of dredged or fill material amounting to 100 cubic yards or less into primary tributaries of navigable waters of the United States or into waters beyond the head of navigation of navigable waters of the United States. Army jurisdiction over inland waters falling within this more limited jurisdiction would extend shoreward to their ordinary high water mark. Primary tributaries of this Alternative are defined as the main stems of tributaries which directly connect to navigable waters

of the United States, and do not include any additional tributaries which extend off of these main stem tributaires.

While the extent of jurisdiction of this alternative is more limited, the Federal review and decision-making procedures specified in Alternative 1, above would remain identical.

Alternative 3. This alternative adopts the broad definition of the "waters of the United States" discussed in Alternative 1, above, but contemplates a different policy with respect to the processing of permits for the disposal of dredged or fill material in waters other than navigable waters of the United States. (Activities for the disposal of dredged or fill material in navigable waters of the United States will continue to be processed in accordance with existing procedures which are generally identical to those proposed in Alternatives 1 and 2). Under this procedure, no applications for a Section 404 permit in waters which are not navigable waters of the United States will be processed (including the issuance of a public notice) until the applicant has furnished the District Engineer in writing a water quality certification from the State pursuant to Section 401 of the FWPCA (33 USC 1341) and also a determination from a State agency designated by the Governor or law of the State that there is no objection to the proposed water disposal of dredged or fill material. If a favorable determination is received, the District Engineer may then process the Section 404 application to conclusion, and in the absence of overriding national factors of the public interest which may be revealed during this processing, a Section 404 permit will generally be issued following receipt of a favorable

State determination. The failure of the responsible State agency to furnish evidence of its approval of the proposed dredged or fill disposal within one year will be regarded as an expression of State disapproval, and the application will be returned to the applicant without processing by the District Engineer. In addition, the waiver by the State of its right to certify this discharge from a water quality standpoint will not be regarded as a favorable State determination. This approach is intended to interject the States into the decision-making process at the initial stages of the application and to give heavy weight to the State decision rather than using that decision as a vehicle to only reflect local factors of the public interest in the overall decision-making process. Such an approach would be consistent with the direct involvement of the States in the control of water pollution at its source as envisioned by FWPCA.

Alternative 4. This alternative, which is favored by the Department of the Army, adopts the limited definition of Alternative 2, and the initial State certification and authorization requirements of Alternative 3 prior to any processing of the Section 404 application for the disposal of dredged or fill material in waters other than navigable waters of the United States.

All of these alternatives pertain to the extent of the Army jurisdiction under Section 404 of the FWPCA and to the decision-making policies and procedures which will be followed by the Corps of Engineers in the processing of permits under Section 404. However, the Environmental Protection Agency still has the right to veto or restrict a particular

disposal site under Section 404(c) even if the Army initially concludes that a Section 404 permit can be issued. This veto or restriction may be exercised by the Administrator, EPA, after notice and opportunity for a public hearing, if he concludes that the proposed water disposal will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas) wildlife, or recreation areas.

The aforementioned alternative proposed changes to this regulation pertain only to activities involving the disposal of dredged or fill material in navigable waters, and do not pertain to other types of activities performed in navigable waters of the United States including the placement of structures such as piers, wharfs, pilings, dikes and dams, or the performance of work such as dredging (unless the dredging operation involves a runoff or overflow back into the water.) These types of activities are exclusively covered by Sections 9 and 10 of the River and Harbor Act of 1899, and the Department of the Army's jurisdiction is limited to those over these types of activities/in or affecting navigable waters of the United States as defined by 33 CFR 209.260 and paragraph d(1) of 33 CFR 209.120.

Prior to the adoption of one of the four proposed alternative regulations outlined above, consideration will be given to any comments, suggestions, or objections thereto which are submitted in writing to the Chief of Engineers, Forrestal Building, Washington, D. C., 20314, ATTN: DAEN-CWO-N, on or before 6 June 1975.

In view of the major impact of these proposed regulations it is strongly recommended that they be carefully studied by all affected and concerned

person, industries, and governmental agencies. During the time of public review of these proposed regulations, Corps District offices will also be reviewing them and commenting upon them with respect to the feasibility of their immediate implementation from a manpower and funds standpoint. While the entire regulation has been published to enable the public to fully comprehend the impact of these four alternatives, only those comments which pertain to the changes in this regulation will be considered.

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
REGION IV
50 7TH STREET N.E.
ATLANTA, GEORGIA 30323

May 21, 1975

OFFICE OF THE
REGIONAL DIRECTOR

Mr. W.B. Lingle
State Conservationist
Soil Conservation Service
Department of Agriculture
P.O. Box 311
Auburn, Alabama 36830

RE: HEW 514-4 75

Subject: Cypress Creek Watershed,
Alabama
Tennessee

Dear Mr. Lingle:

We have reviewed the revised subject draft Environmental Impact Statement. Based upon the data contained in the draft, it is our opinion that the proposed action will have only a minor impact upon the human environment within the scope of this Department's review. The impact statements have been adequately addressed for our comments.

Sincerely yours,

Philip P. Sayre
Regional Environmental Officer

cc:
Charles Custard (control slip)
Warren Muir (2 copies)

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
BIRMINGHAM AREA OFFICE
DANIEL BUILDING, 15 SOUTH 20TH. STREET, BIRMINGHAM, ALABAMA 35233

REGION IV
Peachtree—Seventh Building
50 Seventh Street, N.E.
Atlanta, Georgia 30323

May 19, 1975

IN REPLY REFER TO:
4.2SS

Mr. W. B. Lingle, State Conservationist
United States Department of Agriculture
Soil Conservation Service
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Re: Cypress Creek Watershed
Located at Lauderdale County, Ala.
HUD Control #264

SUBJECT: Request for HUD Comments on Draft Environmental Impace Statement

We are pleased to acknowledge receipt of the above referenced request for HUD comments under the requirements of the National Environmental Policy Act of 1969 (PL 91-190).

We have reviewed the information submitted along with your referral and, to the extent of our available staff resources, have investigated the environmental impact, adverse effects, alternatives, short-term uses of the local environmental and long-term productivity and irreversible and irretrievable commitment of resources which the project involves. From the information available to us, we find no basis for formal comment because of special HUD interest or expertise. However, we would call your attention to the areas indicated on the attached "HUD Comments on Draft Environmental Impact Statement" which we feel would assist your agency in the evaluation and execution of this project.

Should further clarification of our review be deemed necessary, please contact me at 325-3272.

Sincerely,

Robert E. Lunsford
Environmental Officer

HUD COMMENTS ON DRAFT
ENVIRONMENTAL IMPACT STATEMENT

Project Identification:

Cypress Creek annexed

Project Location:

Lafourche Lake County Area

The following includes the general caveats and remarks which we feel should be brought to the attention of any State, local or Federal agency which has requested HUD review of and comment on a draft Environmental Statement under the Environmental Policy Act of 1969 and the CEQ Guidelines. We have checked those comments which seem to be particularly applicable to the draft statement identified above; however the letter of transmittal will amplify these general comments if appropriate.

COMMENTS

☐ Inasmuch as HUD has no direct program involvement in Historic sites or structures effected by the subject project, we defer to the Advisory Council on Historic Preservation with respect to Historic Preservation matters.

☐ HUD has direct program involvement in the Historic Preservation aspects of the proposed project and appropriate comment is included in the transmittal letter.

☐ The subject project effects an urban park or recreational area and appropriate comment is included in the transmittal letter.

☐ The subject project effects only rural parks and recreational areas and HUD therefore defers to the Forest Service of the Department of Agriculture, the Bureau of Outdoor Recreation, Bureau of Land Management, National Park Service and the Bureau of Sports Fisheries and Wildlife with respect to comments on the Parks, Forests and Recreational effects thereof.

☐ This project will probably involve a statutorily required HUD review under Section 4(f) of the Transportation Act of 1966. Therefore, we defer comment on the parks and recreational aspects of the project pending request by D.O.T. for such a review.

☐ This review covers the HUD responsibilities under Section [illegible] of the Transportation Act of 1966.

☐ The Draft Environmental Statement fails to reflect clearance or consultation with the appropriate local planning agency which is: _____

☐ The Draft Environmental Statement fails to reflect consultation or clearance with the appropriate areawide planning agency which is: _____

☐ The Draft Environmental Statement fails to reflect consultation or clearance with the appropriate State Clearinghouse as required by Circular A-95, Office of Management and Budget. The A-95 Clearinghouse of jurisdiction is: _____

☒ The project apparently requires the displacement of businesses or residences. The Draft Environmental Statement does not reveal full consideration of the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646). If relocation assistance is desired, please contact Mr. Bob Lunsford, Director, Operations Div. Daniel Bldg., 15 So. 20th Street, Birmingham, Ala. at 205-325-3697. In the local community the person or office most familiar with relocation resources is: *Mr. Ross Tyree, Electric Power Authority, Bus Street, Electric Station*

☐ The draft statement does not discuss apparently feasible alternatives which may have a more beneficial effect on the urban environment. See letter of transmittal for possibly overlooked alternatives.

☒ In general, HUD defers to other agencies with respect to establishing and enforcing air and water quality standards, thermal pollution standards, radiation and general safety standards. We have no formal jurisdiction over such matters and no comments contained herein should be construed as assuming such responsibility or jurisdiction.

☐ Since this project raises issues involving radio [illegible] safety, we recommend consultation with: Dr. Joseph Fisher [illegible] Office, N.T.I.A., 5609 Fishers Lane, Parklawn Bldg. Rockville, Maryland 20852.

☐ We recommend that you write or call the Office of Management and Budget for a copy of "Directory of State, Metropolitan and Regional Clearinghouses under U.S.C.B. Circular A-95," and consult with such clearinghouses as appropriate.

5/15/75
DATE

PREPARED BY
(FIELD REPRESENTATIVE)

5-16-75
DATE

CONCURRED IN
(PROGRAM MANAGER)

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

PEP ER 75/313

JUL 28 1975

Dear Mr. Lingle:

The work plan and draft environmental statement for Cypress Creek Watershed, Lauderdale County, Alabama and Wayne County, Tennessee have been reviewed in accordance with your March 28, 1975, request. The Department's Fish and Wildlife Service has had to revise its original report on this project because of recent, substantial modifications of the original Soil Conservation Service work plan including a large increase in the amount of channel modifications to be performed, an important change in the nature of the modifications, and verification of the presence of the slackwater darter (Etheostoma boschungi, a species currently being considered for official listing as either endangered or threatened under the provisions of the Endangered Species Act of 1973) in the watershed. Our revised report is currently being finalized and will be released to the Alabama State Conservationist directly by the Regional Director, Fish and Wildlife Service, Atlanta, Georgia when it is completed.

While the project as currently designed will have substantial adverse impacts upon the environment, we are particularly concerned about the impact of the proposed project upon the slackwater darter. This species has been identified as a candidate for protection under the Endangered Species Act of 1973. Section 7 of the Act states "all other Federal Departments and Agencies shall . . . insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical." In our view, the proposed project will make more uncertain the continued existence of the slackwater darter; and, therefore, could be in ultimate conflict with a decision to list the slackwater darter as an endangered species.

Furthermore, we question if the December 1974 draft work plan fully complies with the intent of the Principles and Standards for planning water and related land resources. Certain important environmental considerations have been neglected completely, while other less relevant and questionable considerations have been emphasized. For example, the abbreviated EQ plan has failed to consider the merits of conserving and managing the miles of streams to be altered, and the miles of streams and acres of land that will be committed to structures. The EQ plan erroneously concludes that the proposed structural measures will contribute to the enhancement of the EQ objective by reducing the frequency and depth of natural over bank flooding (flood control) and by destroying or inundating terrestrial habitat. Since many of the proposed flood control measures are not related to enhancement of environmental quality as defined by Principles and Standards, it is inappropriate to include them in the EQ plan at the expense of precluding the conservation, preservation, restoration, or improvement of the existing natural resources within the project area.

Support for the above comments is found in the Water Resources Council publication, "Water and Related Land Resources, Establishment of Principles and Standards for Planning," Federal Register, September 10, 1973, Volume 38, Number 174. On page 33, the Environmental Quality objective is defined as follows: "The environmental objective is enhanced by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems in the area under study and elsewhere in the Nation. This objective reflects society's concern and emphasis for the natural environment and its maintenance and enhancement as a source of present enjoyment and a heritage for future generations." (Underlining added.) The environmental quality objective stresses the natural environment, a state of nature which, in this case, should not include structural measures such as those described in the abbreviated EQ plan. Furthermore, these measures will have adverse impacts upon the natural ecosystem within the project area and in downstream areas.

On page 32 of the Principles and Standards, the National Economic Development objective is defined as follows: "The national economic development objective is enhanced by increasing the value of the Nation's output of goods and services and improving national economic efficiency." The following quoted material from a portion of the Principles and Standards dealing with the NED objective further indicates that flood control features are properly included under the NED objective. Page 41, section b, at the bottom of the page includes: "Urban flood damage alleviation." Page 44, section b, has the following title: "Flood control, land stabilization, drainage, and related activities." Additional material within this specific section elaborates upon these topics. The above demonstrates that the proposed structural measures relating to flood control in Cypress Creek Watershed are more appropriately associated with the NED objective.

Because of these shortcomings, this Department questions the merits of implementing the Cypress Creek Watershed project as presently planned.

The following comments pertain to the draft environmental statement and are presented according to the statement's format.

Summary

In Part V, Summary of Environmental Impacts, the first sentence does not constitute environmental impacts but reads as if it were a list of project goals. This should be placed in the section entitled, "Project Purpose and Action."

Environmental Setting

No current mineral production is known in Lauderdale County, Alabama. In Wayne County, Tennessee, only sand and gravel are being produced, but crushed stone has been produced and should be produced in the future. The proposed structures will preempt future extraction of these surficial deposits from project sites, but the proposals will not significantly affect their supply in the general area.

The Chattanooga Shale lies beneath this watershed at depths from 100 to greater than 250 feet and is a potential source of low-grade uranium ore. The draft work plan adequately describes the mining of this radioactive material as a remote possibility. It should also be mentioned in the environmental statement.

The statement does not adequately identify cultural resources nor does it adequately assess the project's potential impact on these resources. While page 80 reports that an archeological survey was made, it does not give information relating to the types and relative values of cultural resources encountered and does not assess project impacts upon them. Also, the statement regarding the National Register should indicate consultation with the most recent list (February 4, 1975, and succeeding monthly supplements).

On page 121 the reference to the Reservoir Salvage Act (P.L. 86-523) should be updated with a reference to the amendments to that Act of May 24, 1974 (P.L. 93-291). The final statement should contain information demonstrating compliance with the Advisory Council on Historic Preservation's (ACHP) "Procedures for the Protection of Historic and Cultural Properties" (36 CFR, Part 800). The final statement should also contain correspondence indicating contact with the State Historic Preservation Officer, particularly if any cultural resources may become eligible for nomination to the National Register of Historic Places.

On page 55, paragraph 3, it is stated that the watershed contains no wetlands as defined in Circular 39. 1/ However, on page 62 it is stated that bald cypress grows in swamps in the lower part of the flood plain. Wooded swamps are specifically identified in Circular 39 as wetlands. The acres of wetlands should be quantified.

The section on page 69, paragraph 1, alludes to significant water quality parameters which were not included. These data should be included to provide the reader with all available information.

1/ U.S. Department of the Interior, Fish and Wildlife Service, "Wetlands of the United States," Circular 39. Issued 1956. Reissued 1971.

On page 72, paragraph 3, it appears that valuable information was deleted. The reader is encouraged to consult distribution maps of the fishes as presented by Boschung, yet no maps are presented. Also, a list of fishes supposedly gives specific information about the habitat requirements of each fish, but the list is conspicuously absent. The data should be included in order to properly evaluate the impacts on the fishery resources.

Page 76, paragraph 3, should state that the slackwater darter is being considered for listing by the Department of the Interior as an endangered species. Consequently, the Soil Conservation Service should review this project, as required by Section 7 of the Endangered Species Act of 1973, and demonstrate in the environmental statement how the proposed construction would affect this species.

The statement does adequately describe and evaluate recreation resources and related environmental values. We would, however, like to correct one inaccuracy in the statement. It is stated on page 78 that "Cypress Creek was studied for inclusion in a state (Alabama) plan for wild and scenic rivers but was not accepted by the Bureau of Outdoor Recreation." The Bureau does not pass judgment on the acceptability of streams included in a State's wild and scenic rivers program. Although the Bureau may provide technical assistance on State rivers studies if it is requested, the decision on whether or not to include a river in a State wild and scenic river system is exclusively the State's.

Environmental Impact

The section on page 112, last paragraph, is misleading and inaccurate. Loss of forestland will result in the direct loss of those members of the wildlife community dependent upon that habitat. This statement should include a discussion of the project-induced losses of forest habitat (699 acres direct and 602 acres indirect) as well as the resultant loss of those animals dependent on that habitat.

The use of conclusions (page 119, paragraph 1) reached by the University of Georgia study of small watershed projects geographically far removed from the subject project site should be tempered with qualifications. The statement was taken out of context and no explanation of the true nature of that study is given.

Referring to page 131, item 8, the wildlife living on the construction sites will not be simply displaced. Total wildlife numbers in the immediate area will be reduced in direct proportion to the reduction of habitat and its carrying capacity in that area.

On page 131, item 10, the affect of project structures and channel work on fishery resources should be quantified in terms of the miles of stream habitat that will be destroyed.

Irreversible and Irretrievable Commitments of Resources
The fact that the loss of forest land will adversely impact wildlife populations should be mentioned on page 144, last sentence.

Sincerely yours,

Stanley K. Horemus

Deputy Assistant Secretary of the Interior

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
Post Office Box 311
Auburn, Alabama 36830

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

8 MAY 1975

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

This is in response to your letter of 28 March 1975 addressed to Commandant, Coast Guard concerning a draft environmental impact statement for the Cypress Creek Watershed, Lauderdale County, Alabama and Wayne County, Tennessee.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

W E. Caldwell

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy C[illegible] of Marine
[illegible]
[illegible]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

May 27, 1975

Mr. W. B. Lingle
State Conservationist
U. S. Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

We have reviewed the Draft Environmental Impact Statement for Cypress Creek Watershed Protection and Flood Prevention in Lauderdale County, Alabama, and Wayne County Tennessee, and are concerned about several features of the project; therefore, we suggest that additional information is needed.

First, it should be stated whether there are implications pursuant to Section 404 of Public Law 92-500. We must point out that if the project is to proceed, appropriate Federal permits may be needed. The Cypress Creek Watershed contains "waters of the United States" into which "...the discharge of any pollutant by any person shall be unlawful" under Section 301 (a) of the Federal Water Pollution Control Act Amendments of 1972. Violation of 301(a) of this Act will occur unless a Federal permit is obtained for the discharge of pollutants into the main stream. Any discharge of dredged material or fill material into the swamp that fills or blocks bypassed portions of the stream's natural channel may require a Section 404 permit from the U. S. Corps of Engineers. Discharges of pollutants other than dredged and fill material into Cypress Creek may require Section 402 (NPDES) permits from EPA.

Furthermore, utmost care should be taken to prevent spoil, etc., deposited on the stream banks from washing or falling back into the stream since it may result in violation of Federal laws.

We further recommend that every precaution be taken to avoid depletion of the limited rural domestic water supplies. Groundwater availability within the watershed will in all probability be affected by the channelization through lowering of the water table. Therefore, an analysis of the hydrologic effect of the groundwater availability should be addressed, since most of the channel work will take place in major streams.

Even though water quality problems may be minor before the project is started, precautions should be taken to minimize erosion. We also advise continuous monitoring of all sediment traps in the basin to detect problems so that corrective measures can be taken early to minimize further degradation. Efforts should also be made to assure that adequate controls are used to prevent groundwater quality degradation.

In addition, we offer these comments:

1. On page 111 it is stated that "the small reduction of cropland, with the planned project implemented, should result in a slight reduction in pesticide use." We suggest that this is contradictory to the chart on page 105 which shows an increase from 39.2 percent cropland without the project to 43 percent with the project.

2. We also feel the Statement could be improved by explaining (1) why the project is to be carried out in two stages; (2) why spoil is to be buried; (3) and if the Threet Creek Cutoff, which "eliminates 2 miles of channel work" also eliminates two miles of stream.

In light of our review and in accordance with procedures, we have assigned a rating of ER- (environmental reservations) to the project and 2 (insufficient information) to the impact statement.

We would like to have five five copies of the final environmental impact statement when it is available, and if we can be of further assistance in any way, please let us know.

Sincerely,

Jack E. Ravan
Regional Administrator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

January 23, 1976

Mr. W. B. Lingle
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

We have reviewed your responses to our May 27, 1975, letter of comments on the draft environmental impact statement for Cypress Creek Watershed and find that you have satisfactorily addressed our environmental concerns.

We will appreciate receiving five copies of the final statement, and if we may be of further service in any way, please let us know.

Sincerely,

John E. Hagan III

John E. Hagan, III
Chief, EIS Branch

TENNESSEE VALLEY AUTHORITY
KNOXVILLE, TENNESSEE
37902

TVA 40TH ANNIVERSARY OF PEOPLE IN PARTNERSHIP

June 5, 1975

Mr. W.B. Lingle, State Conservationist
United States Department of Agriculture
Soil Conservation Service
Post Office Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

As requested in your letter of March 28, 1975, we have reviewed the draft watershed work plan for Cypress Creek watershed, Alabama and Tennessee.

As indicated in TVA comments on previous drafts, the enactment of flood plain regulations should be encouraged since the project provides only an agricultural level of flood protection. We hope the flood plain restrictions mentioned under the abbreviated environmental quality plan in the addendum will be enacted and enforced, particularly in the urbanizing area outside Florence. We have been working with the city and would be willing to assist the SCS in working with the county concerning flood plain regulations, if you desire.

The proposed channel work in the vicinity of Lindsey Creek and Middle Cypress Creek may require the relocation or modification of TVA's existing 161-kV transmission line from Colbert Steam Plant to Mt. Pleasant substation. As final plans are formulated, they should be coordinated with Henry A. Kyle, Jr., who is Superintendent of the Alabama-Mississippi District of TVA's Division of Power System operations. His office is at 522 First Federal Building in Florence, Alabama, and his phone is (FTS) 383-4511. No future transmission facilities are now planned for the area covered by the project.

TVA comments on the draft environmental impact statement are being coordinated by Dr. Peter A. Krenkel, Director of Environmental Planning, and will be sent separately.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

Edward H. Lesesne
Director of Water Control Planning

TENNESSEE VALLEY AUTHORITY
MUSCLE SHOALS, ALABAMA 35660

May 14, 1975

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 311
Auburn, Alabama 36830

Dear Bill:

Thank you for an opportunity to review the Draft Watershed Work Plan and the Draft Environmental Impact Statement for the Cypress Creek Watershed.

We are pleased that you have reached this stage in developing the project, and we are also pleased with the local interest it has generated. A few minor comments--mostly editorial--are enclosed for consideration in your review. Best wishes to you as you enter the implementation stage of the project.

Sincerely yours,

Gerald G. Williams, Director
Division of Agricultural Development

Enclosure

WORK PLAN

Page 3. Are provisions being made for technical assistance to develop potential for waterfowl and fish management in the 19 permanent pools?

Page 14. Would the term Plinthite be more appropriate than "hardpan"?

Page 85. Part 3. Should the word be "comulative" or "cumulative"?

Page 158. Last word. Is the proper word here "property" or "project"? It seems that real property would have indefinite life in context of the sentence.

ENVIRONMENTAL IMPACT STATEMENT

In the discussion of disposal of bedload material removed from channels, there is considerable effort to describe methods of burial and considerable expense to be made in the process of burial. Could the material be used for construction materials such as gravel for driveways or low traffic roads, building foundations, fill for swamp areas, etc.?

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

June 4, 1975

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

In response to your letter of April 8, 1975, transmitting the draft workplan and environmental impact statement for Cypress Creek Watershed, we are categorizing our comments as follows:

Stream Classification

Use

Page 52--The use classifications adopted on May 5, 1967, by the Alabama Water Improvement Commission for interstate waters of the Tennessee River basin were based on existing water uses and not the potential for future use, as indicated in the third paragraph. This is also true of the use classifications for intrastate streams which were adopted on June 19, 1967.

Page 52--The last sentence of the third paragraph implies that water quality in Cypress Creek and its tributaries needs improvement to meet the use classifications established for them by the Alabama Water Improvement Commission. However, all water quality data given in the statement show that the streams in the Cypress Creek watershed meet applicable water quality standards for the fish and wildlife use classification. Biological studies referenced in the statement also support this fact.

Page 54--The water use classifications given are those adopted in 1967. An amended listing (September 17, 1973) is available from the Alabama Water Improvement Commission. The amended use classifications are: public water supply, swimming, fish and wildlife, and fish and wildlife as a goal. Cox Creek has been classified for fish and wildlife from Cypress Creek to its source. On September 17, 1973, the Alabama Water Improvement Commission adopted as a goal a classification of fish and wildlife for all waters of the State which were unclassified at the time. This

use classification would apply to all streams in the Cypress Creek watershed which were not included in the official classification listing.

Supply

Page 95--This statement acknowledges the existence of the Florence, Alabama, public water supply intake located at Cypress Creek mile 8.5; however, the effect on the water supply of increased turbidity levels resulting from bedload removal is not addressed.

Page 111--It is stated that "the project will have very little effect on dry-season streamflow." We recommend that minimum flow releases from all the floodwater retarding structures be equivalent to or exceed the natural 7-day, 10-year minimum flow. This is especially needed for maintaining acceptable water quality in Lindsey Creek, which receives the treated effluent from the Central High School secondary sewage treatment plant. The 7-day, 10-year minimum flow of Lindsey Creek at the Natchez Trace Parkway is estimated to be about 530,000 gallons per day.

Disposal

Page 18--What arrangements will be made for disposal of the wastewater from the displaced hog farm waste treatment lagoon?

Page 126--What provisions have been made for the disposal of sewage from the rural residential developments identified adjacent to sites 20 and 21? Based on the information provided by the Soil Association Map, Appendix E, the soil types identified in the general area of the developments are noted for poor soil adsorption rates, which will interfere with subsurface sewage disposal systems. If a discharge below the proposed impoundments is anticipated, comment 5 regarding minimum flow releases would be applicable.

Scenic

The statement on page 79 referring to BOR's unacceptance of Cypress Creek as an Alabama scenic river is inaccurate. BOR does not establish criteria for state scenic rivers but screens potential candidates for inclusion in the National System of Wild and Scenic Rivers. As a matter of fact, we were unable to find

any mention of Cypress Creek in the reference cited. However, in Volume 5 of the Alabama Statewide Comprehensive Outdoor Recreation Plan, Cypress Creek is mentioned as one of eleven streams recommended by the Governor of Alabama in 1968 for possible inclusion in the national system but the results of this recommendation were unavailable for the report. We suggest this reference be checked.

Recreation

No discussion is made of the influence of the Cypress Creek Project on canoeing in the downstream of the creek. This recreational pursuit attracts significant numbers of canoeists from the surrounding area.

Impacts

On TVA Projects

The proposed channel work in the vicinity of Lindsey Creek and Middle Cypress Creek may require the relocation or modification of TVA's existing 161-kV transmission line from Colbert Steam Plant to the Mt. Pleasant Substation. As final detailed plans are formulated, they should be coordinated through Mr. Henry A. Kyle, Jr., District Superintendent, Alabama-Mississippi District, 522 First Federal Building, Muscle Shoals, Alabama 35660.

No future transmission facilities are now planned for the area covered by the watershed project.

In addition, the initial filling of the sediment pools with water will result in a relatively small loss of power at Pickwick and Kentucky Dams. We question whether or not full consideration has been given to the disposition or modification of the 19 earth dams after the sediment pools are filled.

On the Stream

Macroinvertebrates--The subject draft environmental impact statement does not contain sufficient information for an independent review of potential impacts on aquatic macroinvertebrates.

There is no evidence in the environmental impact statement or the "Draft Watershed Workplan for Cypress Creek Watershed" to support the statement in the "Abbreviated Environmental Quality Plan," page 1, first sentence, that the project will ". . . preserve and enhance the biological resources and ecosystems; . . ."

Presence of three families, 12 genera, and 26 species of clams and mussels and six families and 12 genera of snails (number of species not stated), along with 14 families, 31 genera, and 56 species of fishes indicates Cypress Creek has a highly diversified aquatic fauna characteristic of a pristine environment rather than a deteriorating one as implied on pages 70 and 71 of the statement.

Plant Resources--Flooding of the bottom-land forest types along the flood plains within the watershed cannot be considered a significant loss. Flooding of forest land along the streams for significant periods also occurs during the dormant season and does not adversely affect the survival or vigor of the naturally regenerated species. In fact, research evidence indicates that periodic flooding, such as that occurring along Cypress Creek and its tributaries, usually increases the growth rate of the more water-tolerant species. In summary, periodic flooding of the forest land can be considered beneficial.

"Water-loving" plants is a misnomer and connotes anthropomorphism. "Water-tolerant" species would be more appropriate terminology.

Forest land improvement practices are scheduled for 5,700 acres (2,000 acres for tree plantings and 3,700 acres for improvement cutting) over a 10-year period; however, since the ". . . landowners and landusers make the decisions . . ." on implementation of conservation plans and forest management plans, these acreages are likely, in reality, only optimistic goals.

Baldcypress (Taxodium distichum) is indigenous to the Cypress Creek watershed and reaches its most easterly distribution in the Tennessee River watershed. Efforts to protect the integrity of this locally sparse species should be encouraged.

Excessive removal of riparian trees will likely result in increased bank erosion and stream migration during maximum flows. Increased stream heating and increased pool warming of the flood retarding structure pools will certainly occur. Loss of the base food supply for stream macroinvertebrates is inherent with tree removal.

Fauna--The avifauna of riparian vegetation was not discussed or studied, and habitat depletion by clearing and channelization may have a significant impact on these populations.

Wooded small creeks and streams provide ideal habitats for wood ducks, particularly when associated with beaver ponds. The wood duck, Aix sponsa, is the only wild, naturally breeding species of duck known from this area.

Wood duck habitat for Cypress Creek has been evaluated by TVA biologists. Ratings of good, fair, and poor are based on criteria that include the presence of water during breeding seasons and mature riparian hardwood vegetation. We find that the proposed project will impact 42 miles of fair wood duck breeding habitat. This amounts to 72 percent of all wood duck breeding habitat in the Cypress Creek watershed and 34 percent of wood duck habitat in Lauderdale County. It is difficult to agree with the draft statement that effects will be insignificant.

Fish--The placement of water control structures on the upper reaches of Cypress Creek will limit the breeding habitat for an apparently already declining fish population by presenting barriers to migration. White bass fishing along Cypress Creek has been considered an area attraction for many years.

Rare and endangered species--In general no identification of stream species, other than fish, seems to have been made and then compared with available or proposed lists.

On the Human Environment

Blood-Sucking Arthropods--No provisions have been made in the draft statement to provide for the control of blood-sucking arthropod pests (particularly mosquitoes) in the areas subject to impoundment. Permanent-pool species of mosquitoes, such as Anopheles quadrimaculatus, A. punctipennis, Culex erraticus, C. territans, Uranotaenia sapphirina, etc., can be expected to colonize these impoundments during the summer season. Statements are made in the document that the marginal and shallow zones of the impoundments can be expected to be colonized by "water-loving" aquatic and semi-aquatic plants; this condition is very conducive to permanent-pool mosquito breeding.

No provisions have been made in the draft statement to provide for control of floodwater species of mosquitoes. During the spring and early summer, at the height of the rainy season, large flat plains will be flooded and then gradually dewatered. If these flood plains

are inundated for a minimum of six days, extensive broods of floodwater mosquitoes may be produced. Reservoir water levels, which fluctuate deeply over an extended cycle, are particularly conducive to the production of this type of mosquito.

We certainly appreciate the opportunity of reviewing your work. We will be happy to provide any additional information or assistance possible if you wish.

Sincerely yours,

J. Clement Burdick

for Peter A. Krenkel, Ph.D., P.E.
Director of Environmental
Planning

CC: Mr. Ray Swicegood
Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 311
Auburn, Alabama 36830

THE ATTORNEY GENERAL STATE OF ALABAMA · MONTGOMERY, ALABAMA 36104

WILLIAM J. BAXLEY
ATTORNEY GENERAL

GEORGE L. BECK
DEPUTY ATTORNEY GENERAL
E. RAY ACTON
EXECUTIVE ASSISTANT
WALTER S. TURNER
CHIEF ASSISTANT ATTORNEY GENERAL
LUCY M. RICHARDS
CONFIDENTIAL ASSISTANT
JACK D. SHOWS
CHIEF INVESTIGATOR

May 21, 1975

Mr. William B. Lingle
State Conservationist
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Sir:

I have just finished reading your draft Environmental Impact Statement for the Cypress Creek watershed. I find it hard to believe that that project has gotten as far as it has. There does not appear, within the covers of that EIS, to be any real need for such a project in that area. Indeed, the cost-benefit ratio is so low as to make the project counter productive. The major benefit to be derived from the project seems to be the amount of money pumped into the economy by the construction work. Three hundred twenty-five (325) semi-skilled and eighteen (18) skilled jobs would be generated. The benefits from flood control are absolutely marginal. Fifty (50) miles of fence would not be hurt by flooding. That is silly. Some roads wouldn't be closed. Some inconvenience for travelers would be alleviated. To do all this, the people of the State of Alabama would have to allow a stream to be turned into a ditch. The taxpayers of the United States would have to pay approximately $9 million. Sir, if you put the money in a bank at 5% simple interest, each year the interest earned would be enough to cover any flood damages and pay welfare to those who would have had jobs from the construction.

Because of our concern for the environment of the State, and the concern of many private citizens expressed to

us about this project, our Office does now request a formal hearing to be held on the Cypress Creek Project. We feel it is in the best interests of the people of this State to halt this Project.

Sincerely,

James R. Cooper Jr.

JAMES R. COOPER JR.
Environmental Division
Office of the Attorney General

JRCjr/mfw

STATE OF ALABAMA

ALABAMA DEVELOPMENT OFFICE

George C. Wallace
Governor

R.C. "Red" Bamberg
Director

W.M. "Bill" Rushton
Assistant Director

June 17, 1975

TO: Mr. W. B. Lingle
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

FROM: Michael R. Amos
Michael R. Amos
State Clearinghouse
State Planning Division

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT

Applicant: Soil Conservation Service

Project: Draft Environmental Impact Statement for the Cypress Creek Watershed in Lauderdale County and Wayne County, Tennessee

State Clearinghouse Control Number: ADO-007-75

The Draft Environmental Impact Statement for the above project has been reviewed by the appropriate State agencies in accordance with Office of Management and Budget Circular A-95, Revised.

The comments received from the reviewing agencies are attached.

Please contact us if we may be of further assistance. Correspondence regarding this proposal should refer to the assigned Clearinghouse Number.

A-95/05

Attachments

Agencies contacted for comment:
Muscle Shoals Council of Local Governments
Conservation and Natural Resources
Historical Commission
Environmental Health Administration
ADO - Wallace

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

REQUEST FOR REVIEW OF PROJECT NOTIFICATION

TO: Mr. Reynolds W. Thrasher
Conservation and Natural Resources

CH Number ADO-007-75

Applicant Soil Conservation Service

Program D.E.I.S. for the Cypress Creek Watershed in Lauderdale County and Wayne County, Tennessee

DATE: April 2, 1975

Return Prior to: May 15, 1975
Date

Please review the attached environmental impact statement and indicate your comment with respect to any environmental impact involved.

Comments: (Please check one block.)

No comment (Environmental impact statement is in order and no additional comments are offered.)

Comments (Elaborate below.)

Comment here:

Would like a copy of the draft for Game & Fish — They kept draft mtl

Signature

Please Return Original to:

Alabama Development Office
Office of State Planning
State Clearinghouse
State Office Building
Montgomery, Alabama 36104

FORM CH-2a
8/71

STATE OF ALABAMA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

64 North Union Street - Montgomery, Alabama 36104

GE C. WALLACE
GOVERNOR
DE D. KELLEY
MISSIONER

May 9, 1975

DIVISION OF GAME and FISH
CHARLES D. KELLEY
DIRECTOR
ARCHIE D. HOOPER
ASSISTANT DIRECTOR

MEMORANDUM

TO: Mr. Reynolds W. Thrasher, Chief
BOR Section

FROM: Ralph H. Allen, Jr., Chief
Game Management Section
Ralph H. Allen Jr

SUBJECT: Comments of Game and Fish Division on SCS's Draft Environmental Impact Statement for Cypress Creek in Lauderdale County, Alabama and Wayne County, Tennessee

Enclosed are the comments of our Division on the Draft Environmental Impact Statement for Cypress Creek.

RHA:rle
ATTACHMENT

After reviewing the Draft Environmental Impact Statement prepared by the Soil Conservation Service on Cypress Creek watershed located in Wayne County, Tennessee, and Lauderdale County, Alabama, the Game and Fish Division of the Alabama Department of Conservation and Natural Resources, offers the following comments.

The work plan as proposed will consist of 19 floodwater retarding structures and 14.4 miles of channel work at an estimated cost of $8,212,650.00. These proposed structural measures when combined with supporting land treatment measures are reported to reduce flood damages by 75 percent.

Installation of floodwater retarding structures will require 3,066 acres of land, channel work will require 320 acres of land outside the present creek channel for a total of 3,386 acres necessary for the installation of the structural measures.

On page 116 of the SCS's draft watershed work plan on Cypress Creek, dated December 1974, but not included in the Draft Environmental Impact Statement, is a chart that lists the acres that will be flooded by storms of one year, two years, 10 years and 100 year frequencies both with and without the project.

This chart and other data within the draft work plan and the Draft Environmental Impact Statement reveals that the project will require the removal from its present use and for the permanent conversion into floodwater impoundments and channel alterations a total of 3,386 acres of land in order to protect:

a. 3,560 acres of flood plains from a one year flood

b. 3,910 acres of flood plains from a two year flood

c. 3,480 acres of flood plains from a ten year flood

d. 2,621 acres of flood plains from a 100 year flood

The cost for this flood protection is $8,212,650.00. Other cost not included in this figure is the annual loss of agricultural crops, forest products, wildlife and other environmental resources on 3,386 acres of land required for the construction of floodwater retarding structures, floodwater impoundments and channelization.

A breakdown reveals that the cost of flood prevention without the above losses on the 3,386 acres included will be $2,250.00 per acre on a basis of a one year flood; $2,100.00 per acre on a basis of a two year flood; $2,360.00 on a basis of a 10 year flood; and $3,133.00 on a basis of a 100 year flood. Had the loss of production on the 3,386 acres of land converted to floodwater impoundments and stream channelization been included the cost per acre for flood control to be provided by the project would be considerably higher.

On page 28 of the Draft Environmental Impact Statement is found the following statement: "In the area of channel work, the upper one-third of bank is primarily silt and the lower two-thirds is primarily silty gravel." This statement indicates that the banks of Cypress Creek are very unstable and any mechanical distrubance such as that created by channelization operations will result in severe bank erosion and sluffing following each rise and fall of water within the stream. It is reasonable to assume that much of the eroding silt and gravel will be deposited downstream in Cypress Creek, the remainder will be deposited in Pickwick Lake.

The Game and Fish Division of the Alabama Department of Conservation and Natural Resources is of the opinion that the original proposal by the SCS to limit the mechanical bed load removal from the stream to maximum segments of 300 feet rather than the one-fourth mile now proposed would result in less environmental damage. It would appear that the shorter segments would allow the streams current to degrade the channel to the desired depth in a shorter period of time thereby reducing the period of continuous distrubance both within the stream and along the stream banks. The shorter segments should reduce the extended areas of mechanical distrubance thereby benefiting both fish and wildlife.

The use of excavated trenches for the deposit of spoil removed during initial channelization work, and periodically thereafter, as the excavated sections of the stream are filled will, in our opinion, create additional environmental damage. It would appear that this spoil material could be used for filling the numerous gullies reported to occur within the watershed with less environmental damage.

It appears to us that environmental damages that will result from the proposed structural measures within Cypress Creek watershed project could be drastically reduced if the floodwater reservoirs were designed as "dry reservoirs," to hold water only during periods of heavy rainfall and not as permanent reservoirs. Such dry reservoirs would not require the removal of trees and other natural cover as is the case of permanent pool reservoirs as now planned. In reality a small dry reservoir could provide temporary holding capacity equal to a large permanent pool reservoir. Dry reservoirs would be less expensive and cause less damage to the environment than would the permanent pool reservoirs now planned. Nothing in the Draft Environment Impact Statement indicated that "dry reservoirs" were considered as alternates to permanent pool reservoirs.

STATE OF ALABAMA
ALABAMA HISTORICAL COMMISSION
725 MONROE STREET
MONTGOMERY, ALABAMA 36104

W. WARNER FLOYD
EXECUTIVE DIRECTOR

TELEPHONE NUMBER
269-6839

September 12, 1975

Mr. W. B. Lingle
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

RE: Cypress Creek Watershed
Lauderdale County

Dear Mr. Lingle:

After a thorough review of our current historic and architectural inventory for Lauderdale County, an examination of historic and current maps relevant to the project and onsite inspections of the area by interested preservationists, the Alabama Historical Commission concludes that the construction of the project will have no adverse affect on any historical sites and/or structures.

There were no prominent archaeological evidences discovered during our record and site examination. Should your construction activity uncover any such evidences, please contact the Alabama Historical Commission for immediate salvage operations.

Sincerely,

W. Warner Floyd

GCB

cc: Mr. Michael Amos
Alabama Development Office

APPROVED:

Milo B. Howard, Jr.
Milo B. Howard, Jr.
State Historic Preservation Officer
National Historic Preservation Act
Public Law 89-665

ALABAMA STATE SOIL AND WATER CONSERVATION COMMITTEE

ROOM 203 RICHARD BEARD BUILDING
1445 FEDERAL DRIVE
P. O. BOX 3336
MONTGOMERY, ALABAMA 36109

April 4, 1975

WILBUR B. NOLEN, JR.
EXECUTIVE SECRETARY

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
P.O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

On behalf of Governor George C. Wallace, the State Soil and Water Conservation Committee has reviewed the "Cypress Creek Watershed" work plan, Lauderdale County, Alabama, and Wayne County, Tennessee, and the "Draft Environmental Impact Statement" pertaining to this proposed project. We find both documents to be in proper order.

The State Committee strongly supports this proposal, which is being planned under authority of Public Law 566, the Watershed Protection and Flood Prevention Act, as amended.

It is our collective judgement that this small Watershed Development would be greatly beneficial to landowners affected by the project, and to the State of Alabama as well. We also believe that the "Environmental Impact Statement" is an accurate reflection of the pertinent facts and conditions which pertain to this watershed.

Very truly yours,

ALABAMA SOIL AND WATER
CONSERVATION COMMITTEE

WILBUR B. NOLEN, JR.
EXECUTIVE SECRETARY

WBN:msh

cc: Honorable George C. Wallace, Governor of Alabama
Howard Jones, Chairman, Lauderdale County Soil & Water
Conservation District Supervisors

STATE OF ALABAMA
HIGHWAY DEPARTMENT
MONTGOMERY, ALABAMA 36104

RAY D. BASS
HIGHWAY DIRECTOR

April 16, 1975

Mr. W. B. Lingle
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, AL 36830

Dear Mr. Lingle:

SUBJECT: USDA-SCS-EIS-WS-(ADM)-75-2-(D)-AL
CYPRESS CREEK WATERSHED PROJECT
LAUDERDALE COUNTY, ALABAMA

We have reviewed the subject Draft EIS enclosed with your March 28, 1975 letter.

We have no objections to the proposed Cypress Creek Watershed Project, nor to we have any comment relative to the statements and conclusions the Draft EIS contains. However, we would like to point out that the State Highway Department has several state and county roads through the Cypress Creek Watershed and the area of your proposal. The State Highway Department is responsible for maintenance and improvements to these various roads. Also, the Highway Department has several proposed roadway and bridge projects through the area. Specifically, we have plans to replace the existing bridge structures across Middle Cypress, Little Cypress and Oakleg Spring branch on Alabama State Route 157. Along Alabama State Route 20 from Florence to Tennessee State Line, we have plans to relocate portions of this highway and make improvements to the remainder. In addition to these specific projects, we are constantly reparing and otherwise maintaining all roadways and highway right-of-ways throughout the Cypress Creek Watershed. It may be beneficial to the Highway Department and S. C. S. to coordinate proposals.

Our primary concern or comment with your proposal is that the State Highway Department be informed of all stream channelization, floodwater retarding structures, bedload removal or channel clearing and shaping where roadway or bridges would be involved.

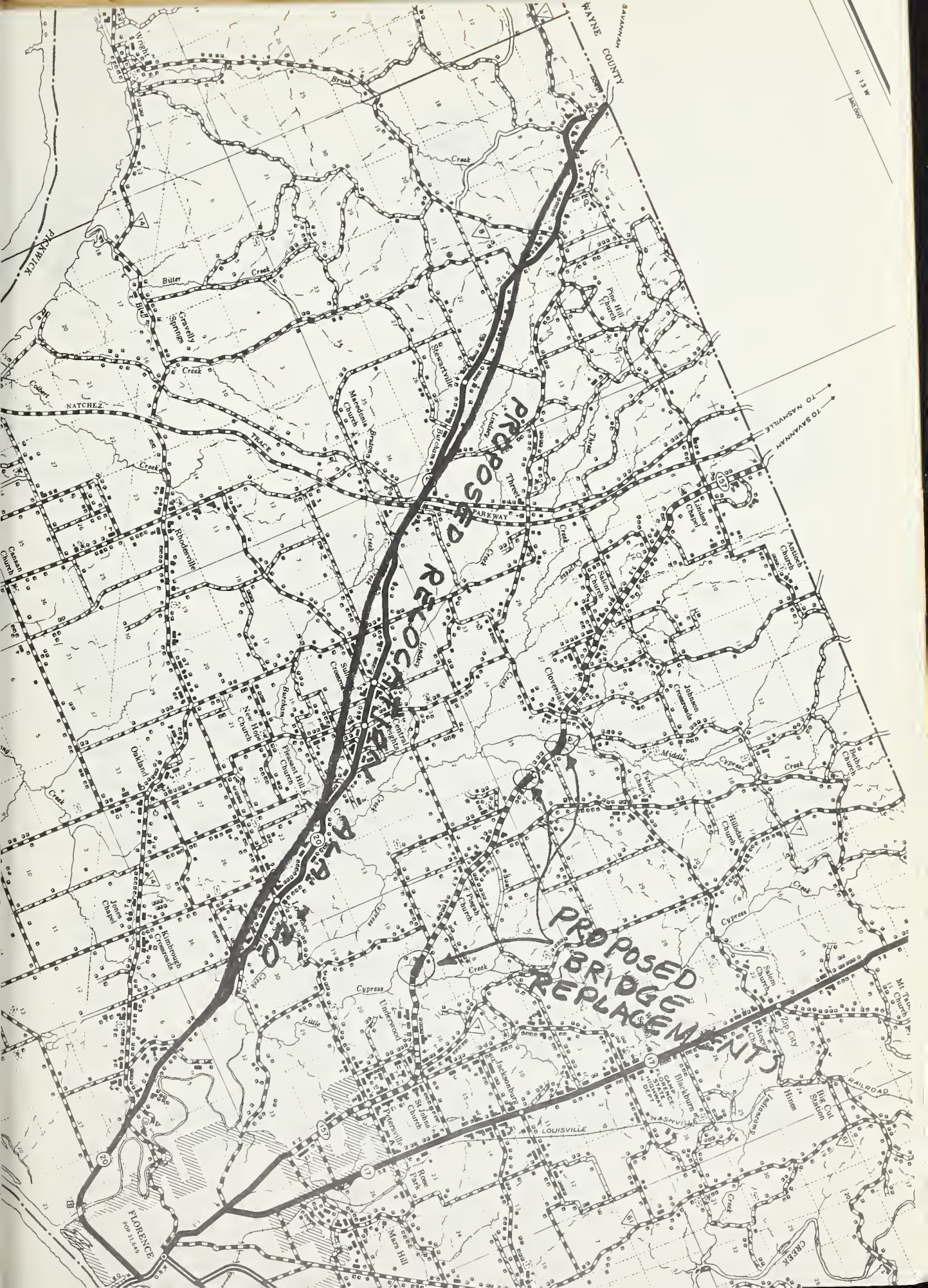
Attached is a county map which illustrates our proposed improvements to Alabama State Route 20 and bridge replacements on Alabama 157. Thank you for the opportunity to express our comments on the Draft EIS. We would appreciate a copy of the Final EIS when available.

Sincerely yours,

J. F. Freeman, Engineer
Bureau of Surveys & Plans

WEP/dk
Attachment

cc Mr. Paul Stough
Mr. C. E. Snipes


PROPOSED BRIDGE REPLACEMENT
PROPOSED BRIDGE REPLACEMENT
WAYNE COUNTY
TO SAVANNAH
TO NASHVILLE
NATCHEZ TRACE PARKWAY
PICKWICK
FLORENCE
POP. 31,649
LOUISVILLE & NASHVILLE RAILROAD
Wright
Butler Creek
Gravelly Springs
Rhodesville
Stewartville
Macedonia Church
Buckhorn
Pine Hill Church
Flintary Chapel
Salem Church
Abtuch Church
Cloverdale
Johnson Crossroads
Bethel Church
Hillsdale Church
Parker Chapel
New Hope Church
Pleasant Hill Church
Oakland
Jones Chapel
Kimbrough Crossroads
Pisgah Church
Underwood
Jacksonburg
St. Johns Church
Peterseville
Rose Park
Main Hill
Blackburn
Hinse
Big Cut Station
Zip City
Mt. Tabor Church
Cypress Creek
Little Cypress Creek
Buffalo River
Creek

STATE OF TENNESSEE
OFFICE OF URBAN AND FEDERAL AFFAIRS
SUITE 108
PARKWAY TOWERS BUILDING
NASHVILLE 37219
615-741-2714

May 30, 1975

Mr. W. B. Lingle, State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

RE: Cypress Creek Watershed
Lauderdale County, Alabama
Wayne County, Tennessee

Dear Mr. Lingle:

As the designated State Clearinghouse for federal development programs under OMB Circular A-95 guidelines, we have conducted a review of the draft environmental impact statement and work plan, dated December 1974, for the subject proposed project. The watershed project is proposed for implementation under authority of the Watershed Protection and Flood Prevention Act, as amended, and comprises on area of 211.5 square miles of which approximately 63% lies in Alabama and 37% in Tennessee.

The Tennessee Wildlife Resources Agency, the independent state agency responsible for preserving and maintaining wildlife and related habitat, has submitted commentary which addresses various deficiencies and inadequacies in the draft statement regarding the proposed project's impact particularly in Tennessee. Also enclosed is a brief comment from the Tennessee Department of Conservation.

This office highly urges that considerable attention and due consideration be given these comments and suggestions which are enclosed. Approval of this project by the State of Tennessee is conditional upon a favorable response from the sponsors and documentation and preparation of the final EIS and work plan which are acceptable.

We appreciate the opportunity to review this proposal and respectfully offer the commentary herein in the spirit of cooperation. We, or other reviewing authorities, may wish to comment further at a later time.

Direct contact may be made with the Tennessee Wildlife Resources Agency for useful input in resolving the numerous points of contention. If this office can be of assistance, please feel free to contact me.

We request ten (10) copies of the final documents upon their completion.

Sincerely,

Stephen H. Norris
Grant Review Coordinator

SHN/bh

Enclosures

STATE OF TENNESSEE
OFFICE OF URBAN AND FEDERAL AFFAIRS
SUITE 108
PARKWAY TOWERS BUILDING
NASHVILLE 37219
615-741-2714

June 16, 1975

Mr. W. B. Lingle, State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
Post Office Box 311
Auburn, Alabama 36830

RE: Cypress Creek Watershed
Lauderdale County, Alabama
Wayne County, Tennessee

Dear Mr. Lingle:

Pursuant to our Clearinghouse review letter of May 30, 1975, we are enclosing comments submitted by the Tennessee Department of Public Health, Division of Sanitation and Solid Waste Management, and Division of Water Quality Control.

Though forwarded later than the comment deadline, we urge that appropriate consideration be given them and hopefully responded to in the final documents.

Sincerely,

Stephen H. Norris

Stephen H. Norris
Grant Review Coordinator

SHN: mn

Enclosure

STATE OF TENNESSEE
OFFICE OF URBAN AND FEDERAL AFFAIRS
SUITE 108 • PARKWAY TOWERS BUILDING • NASHVILLE 37219 • 615-741-2714

RAY BLANTON
Governor

WASHINGTON BUTLER, JR.
Director

October 9, 1975

Mr. W. B. Lingle, State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
Post Office Box 311
Auburn, Alabama 36830

RE: Cypress Creek Watershed
Lauderdale County, Alabama
Wayne County, Tennessee

Dear Mr. Lingle:

As per Mr. Ray Swicegood's phone request of October 8, we are transmitting copies of all State agency responses regarding our review of the draft environmental impact statement and watershed work plan on the subject proposed project. Also enclosed is a copy of the interagency office memo requesting said comments.

If this office, as the officially designated State Clearinghouse, can be of further assistance in this or any other matter, please feel free to call on us anytime.

Sincerely,

Stephen H. Norris

Stephen H. Norris
Grant Review Coordinator

SHN: mn

Enclosures

cc: Mr. Ray Swicegood

State of Tennessee
DEPARTMENT OF AGRICULTURE

ELLINGTON AGRICULTURAL CENTER
Box 40627, Melrose Station
Nashville, Tenn. 37204

Ray Blanton, *Governor*
Edward S. Porter, *Commissioner*

April 14, 1975

MEMORANDUM

TO: Mr. Stephen H. Norris, Grant Review Cordinator

FROM: James S. Gill, Staff Attorney

SUBJECT: USDA (Soil Conservation Service) - Cypress Creek Watershed
Lauderdale County, Alabama and Wayne County, Tennessee

The above-named proposal has been reviewed and evaluated by this Department in light of our plans, needs and priorities.
Our comments are indicated below:

__XX__ No objection

_____ Objection (Explained below)

_____ Comment (Explained below)

RAY BLANTON
GOVERNOR

B. R. ALLISON
COMMISSIONER

M. P. ESTES
ASSISTANT COMMISSIONER

ASSISTANT COMMISSIONER

TENNESSEE
DEPARTMENT OF

Conservation

DIVISION OF FORESTRY

2611 WEST END AVENUE • NASHVILLE, TENNESSEE 37203

MAX J. YOUNG, State Forester

March 12, 1975

3510

Mr. W. B. Lingle
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

This is in regard to draft copies of the Watershed Workplan and the Environmental Impact Statement for Cypress Creek, Lauderdale County, Alabama, and Wayne County, Tennessee, recently received from your office.

We have reviewed both documents and consider them adequate for publication.

Sincerely,

Max J. Young

MAX J. YOUNG
State Forester

hz

Tennessee Department of
Conservation
Division of Planning & Development
RAY BLANTON - GOVERNOR
B.R.ALLISON - COMMISSIONER
2611 West End Ave. Nashville, Tennessee 37203 (615)741-1061
WALTER L. CRILEY-DIRECTOR

April 16, 1975

APR [illegible]

Mr. Steve Norris
Grant Review Coordinator
Urban & Federal Affairs
108 Parkway Towers Bldg.
Nashville, TN 37219

Re: USDA (SCS)
Cypress Creek Watershed

Dear Mr. Norris:

The above captioned project presents no conflicts with existing programs of the Tennessee Department of Conservation. The federal Bureau of Outdoor Recreation (Atlanta office) has recently prepared a feasibility study, however, for the development of the Natchez Trace National Scenic Trail. This trail will traverse the general area of this project. The Soil Conservation Service should coordinate this project with plans for the trail's development.

Sincerely,

Walter L. Criley

by: Joe Gaines
Program Administrator

jh
cc: Robert Baker, BOR

RAY BLANTON
GOVERNOR

Eugene W. Fowinkle, M.D., M.P.H
Commissioner

STATE OF TENNESSEE
DEPARTMENT OF PUBLIC HEALTH
NASHVILLE 37219

June 10, 1975

Mr. Stephen H. Norris
Grant Review Coordinator
Office of Urban and Federal Affairs
Parkway Towers Building, Suite 108
Nashville, Tennessee 37219

Re: Environmental Impact Statement, Cypress Creek Water Shed, U. S. Department of Agriculture (Soil Conservation Service), Lauderdale County, Alabama, and Wayne County, Tennessee

Dear Mr. Norris:

As requested in your memorandum of April 4, 1975, staff of our Divisions have reviewed the above referenced project and following are their comments:

DIVISION OF SANITATION AND SOLID WASTE MANAGEMENT

As proposed by the above document, flood water retarding structures 1, 2, 3, 5, 6, 7, 10, 18, and 19 are located in Wayne County, Tennessee, and would be subject to the requirements of "The Tennessee Impounded Water Act" and the regulations adopted under the law (Tennessee Code Annotated 53-801 - 53-809).

The draft states that the sediment pools of the structures will be prepared to meet Health Department requirements. It also states that maintenance of the impoundages will be the responsibility of the sponsoring agency. It was not noted that anyone was responsible for securing permits as required by the law. It should be pointed out that prior to construction "Application for Permit for Impoundage Construction" should be made for each impoundage in Tennessee and be accompanied by a plat of the impoundage. As each impoundage is completed, it should also be pointed out that prior to impounding water "Application for Permit for Impoundage and Maintenance of Impounding Water" should be submitted with ample time allowed for an inspection by the Tennessee Department of Public Health to determine if construction requirements have been met.

DIVISION OF WATER QUALITY CONTROL

A project for watershed protection and flood prevention in Lauderdale County, Alabama, and Wayne County, Tennessee, has been proposed by the U. S. D.A., Soil Conservation Service, to be implemented under the authority of the Watershed Protection and Flood Prevention Act (P. L. 566, 83rd Congress, 68 Stat. 666), as amended.

The project proposal includes an accelerated conservation land treatment program, retention structures, and 14.4 miles of channel work. The intent of the project is to reduce floodwater damages, erosion, and sedimentation. Comments from this Division concerning the potential environmental effects of the project are presented below.

The accelerated conservation land treatment program, as proposed, would undoubtedly benefit water quality in the Cypress Watershed by decreasing soil erosion problems in the area. To accomplish this end, local land owners would be encouraged to improve cropping systems and pasture and hay land management, provide wildlife food and cover through upland game habitat management. The treatment of critically eroding gullies and borrow pits by the SCS should also tend to lessen soil erosion problems and subsequent sedimentation in adjacent streams.

The construction of 19 floodwater retention structures, nine of which will be located in Tennessee, will affect water quality in a number of ways, both beneficial and detrimental. On the beneficial side, water immediately downstream from the impoundments created by the permanent sediment pool dams should be lower in suspended solids concentrations due to the settling of these solids in the impoundment basins. In addition, some flow augmentation should be accomplished through the gradual release of accumulated storm waters from the impoundments, a phenomenon which should extend the duration of stream flow in what might otherwise be intermittent streams. The provision of flood protection for local land owners, their outbuildings and fences, and for private and public roadways would also be realized.

The detrimental effects of the construction of these floodwater retention structures would be several. Initially, short-term destruction of aquatic life and habitat in the affected area would occur during the construction period. After construction, the impounded waters would be subject to temperature increases which would likely cause species changes within the reservoirs,

a situation which is not automatically labeled detrimental. However, the submerged outlets from the impoundments, unless properly regulated during stratification periods in the warmer months, will discharge cool water deficient in oxygen and possibly carrying a substantial BOD load. In addition, soluble salts of iron and manganese which are leached into oxygen deficient waters of such impoundments would flocculate or precipitate out of the water when oxidized in the reoxygenated water below the dams and would coat the stream bottom downstream from the impoundments. Such an occurrence would impair spawning and propagation of fish and fish food organisms for some distance downstream from these reservoirs.

Concerning the proposed channel improvement work, the Tennessee Division of Water Quality Control is concerned with the physical disruption and destruction of natural stream habitats. Such mechanical disruption of the stream bed, alteration of the stream channel and bank, and removal of stream bank vegetation invariably causes numerous water quality problems downstream, and in this case, channel alteration would ironically reintroduce the sediment load which is supposedly being removed by the construction of permanent sediment pool dams. Channelized stream bank areas are notoriously susceptible to scouring and erosion where the vegetative cover has been removed. The increased sediment load introduced into the areas downstream from the channelization work would have definite detrimental effects upon aquatic life, and additional sediment loads would be introduced every time channel maintenance work was conducted in the channelized area.

Thank you for the opportunity to comment on this project.

Very truly yours,

C. Ron Culberson

C. Ron Culberson
Supervisor of Promotion and Communication
Bureau of Environmental Health Services

CRC:kst

STATE OF TENNESSEE
TENNESSEE HISTORICAL COMMISSION
170 SECOND AVENUE, NORTH
NASHVILLE, TENNESSEE 37201
TELEPHONE (615) 741-2371

LAWRENCE C. HENRY, Executive Director
State Historic Preservation Officer

APR 09 REC'D

April 9, 1975

Mr. Stephen H. Norris
Office of Urban and Federal Affairs
Suite 108, Parkway Towers
Nashville, Tennessee 37219

SUBJECT: (1) Mud Lake Pumping Station
Memphis District, Corps of Engineers

(2) USDA (Soil Conservation Service)
Cypress Creek Watershed
Lauderdale County, Alabama, and Wayne
County, Tennessee

Dear Mr. Norris:

This will acknowledge receipt of draft environmental impact statements and plans for the above projects.

From a review of the information submitted, it does not appear that these projects would affect any plans or priorities of this agency.

Sincerely,

Herbert L. Harper

Herbert L. Harper
Field Services

HLH:sf

TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
P. O. BOX 40747
NASHVILLE, TENNESSEE 37204

MAY 29 RECD

HARVEY BRAY, Executive Director
ROY H. ANDERSON, Ass't. Director
GARY T. MYERS, Ass't. Director

May 27, 1975

Mr. Stephen H. Norris
Grant Review Coordinator
Office of Urban and Federal Affairs
Suite 108
Parkway Towers Building
Nashville, Tennessee 37219

Re: Draft Environmental Impact Statement, for Cypress Creek Watershed; Lauderdale County, Alabama, and Wayne County, Tennessee

Dear Mr. Norris:

The Tennessee Wildlife Resources Agency, (TWRA), working within the intent of the Wildlife Resources Act of 1974, has reviewed the DEIS for Cypress Creek Watershed and submits the following comments. Of the 135,360 acres in the watershed area, approximately 50,370 acres are in Tennessee, all of which might be classified as headwaters of the Cypress Creek drainage. TWRA has an interest and an obligation for reviewing the entire project since activities in Alabama could adversely affect wildlife in Tennessee.

The project purpose is to provide watershed protection and flood prevention. To accomplish this purpose, the project proposal includes an accelerated conservation land treatment program, 19 floodwater retarding structures and 14.4 miles of channel work. All streams with planned channel work are perennial with 14 miles of natural channels and 0.4 miles of previously modified channel. Type of work includes bedload removal, clearing and shaping, and new channel excavation. Floodwater damages, erosion and sedimentation are to be reduced. Seven alternatives are considered in the project development.

The statement of Purposes and Goals (Pages 1-2) recognizes that the landowners plan to convert more of the floodplain into cropland and pastureland with resulting flood protection. They also stated that they plan to manage the floodplain at a higher level since the threat of flooding would be reduced. It is the understanding of TWRA that there are 1381.3 acres in Wayne County under the Cropland Adjustment Program. This program offers monetary consideration to landowners not to plant various lands. It is, therefore, contradictory to partially justify this watershed program on the premise of providing or permitting more cropland development when in fact various lands are under agricultural programs calling for "land retirement".

Land treatment measures (pages 2-12) are to be accomplished through the development and implementation of conservation plans and forest management plans on individual farms. Accelerating this program is of considerable importance as referenced by erosion and sedimentation rates noted in this DEIS. The need for land treatment has been discussed in the Wayne County RECP Plan which noted needs on 44,424 acres of cropland in tillage rotation, 13,005 acres in other cropland, 4,339 acres in pasture, 348,115 acres of forestland, and 2,500 acres of other land. An unknown portion of this land is in the Cypress Creek Watershed. These needs have been known for several years, the above being condensed from the 1967 Conservation Needs Inventory. TWRA questions how S.C.S., through this watershed proposal, can assure the follow-up of recommended land treatment measures, particularly since the landowner or landuser would have the final responsibility for implementation. This assurance might be further documented by results of similar watershed projects. What assurance can be given that maintenance would continue following completion of the developmental portion of the project?

On page 4, comment is made concerning the lack of adequate soil surveys in Wayne County. What assurance can be given that the recommended stream structures will hold water as proposed in view of this lack of information?

On page 6, reference is made to "170 acres of wildlife land". Where is this acreage located? Wildlife is a product of the land and is beneficially or detrimentally affected by the management of that land. Unless the 170 acres are in reference to specifically designated wildlife land, it must be assumed that actually several thousands of acres in the watershed are "wildlife lands" and as such would be influenced by whatever land treatment measure is prescribed to those lands. This influence would apply to both terrestrial and aquatic forms of wildlife. As more land would be converted from a mixed vegetative type to more monotypic farming and cultivation, the impacts on these wildlife categories could be detrimental to wildlife productivity and its associated recreational use.

In reference to critical areas (page 6 and 10), TWRA recommends the immediate correction of these sediment/siltation sources. As a general overview of the DEIS, it would appear that these areas along with runoff are the major sources for most of the watershed problems. What assurance can be given that maintenance will be continued.

Field borders (page 8) and wildlife food plots (page 9) are best utilized by wildlife when protected from grazing by cattle or similar impacts. What protection will be afforded to such areas and who will provide and maintain the areas to insure their best value as habitat (food, shelter, and travel lanes) for wildlife? Protection of such areas becomes more important as land uses are changed to uses detrimentally affecting terrestrial wildlife habitat.

The installation of drainage field ditches would be best applied to those existing croplands with low areas which retain surface waters for an extended period of time (page 8-9). However, TWRA would question as a part of this project the ditching of those areas classified as swamps or permanent wet areas. Such areas provide a type of important wildlife habitat which is being lost at an alarming rate. In addition to wildlife habitat, swamps provide a filtering system for removing silt, pesticides and other pollutants from surface runoff.

Tree plantings should include hardwoods and softwoods distributed according to site capabilities and in a checkerboard pattern rather than in large blocks (page 11). This distribution will provide valuable "edge" and substantially improve wildlife habitat. Forest management plans and other land treatment plans should reflect wildlife values as suggested by the State fish and wildlife management agencies. What guidelines will be followed when removing "cull and inferior trees"? An adequate number of den trees should be left as well as maintaining a diversified habitat of several tree species.

What guidelines will the sponsors be given for the operation of water level control gates on Structures 6, 10, 15, 16, 17, 18 and 19? What food will be available for wildlife and waterfowl at these sites? What criteria were used to specifically recognize these structures for wildlife and waterfowl and not the remaining 12 structures? Why were cool water outlets not included in all of the structures? What will be the deposition of materials from shoreline deepening if the material is not needed for structure embankments? These questions relate to statements made on pages 14 and 15.

One S.C.S. technique for controlling erosion from critical areas involves the construction of "brush dams". Is this not a viable use of brush from structure site preparation rather than burning or burying? Given the choice of disposal, on-site burning would be the choice of most contractors (page 19).

On page 20, reference is made to incidental recreation around floodwater retarding structures. Would this recreational opportunity be for public or for the personal use of the landowner involved at a specific site? What assurance can S.C.S. give that even with adequate sanitary facilities public recreation would be available? Complaints of watershed projects from groups concerned with public recreation include the use of federal funds to construct structures (with assigned recreational benefits) which destroy or disrupt recreational opportunities without adequate provisions for continued or improved public recreational use. If public recreation cannot be provided, created recreational opportunity should not be totally included as a benefit to the project.

Channel work (page 21-32) should not be attempted until critical areas and other sediment/silt sources are stabilized. Such activity should follow the construction and evaluation of floodwater control structures. Given the

protection of the 19 structures, an evaluation of the watershed should determine if normal stream flows are moving out obstructive bedload deposits permitting runoff with a minimum of flooding conditions. As noted previously, TWRA has an interest in downstream alterations as they might affect fish movements from Alabama into Tennessee.

Appendix C, a map showing locations of structures and channel work, does not indicate the channel work on Dulin Branch noted on page 21. This branch was modified by man in 1954 and is referenced now as being partially or completely clogged with gravel. What assurances can be given that if cleared now it will not be clogged again in the next 20 years? Rock ledges, shoals, gravel bars and logs favorably contribute to the fish habitat of a stream. Their removal is a detrimental impact to the aquatic habitat.

Spoil from the channel work should not be placed in sloughs on oxbows capable of supporting fish and other aquatic life (page 29). Its placement would be best in sites outside of the floodplain to prevent further encroachment on the floodwater storage area.

Riprap should be of large size to provide habitat for small fish and other aquatic organisms (page 30). This is especially true for embankments below base flow.

Operations and Maintenance (page 33-36) outlines how inspections will be made by project sponsors and S.C.S. This inspection should include items relating to wildlife habitat and environmental enhancement. Who will be responsible for vegetation maintenance associated with structural measures after the three-year period following completion of the structure? What assurance can be given that maintenance would continue?

On page 55 reference is made to the Fish and Wildlife Service publication, Wetlands of the United States, Circular C-39, and to the fact that no wetlands are in the watershed. However, on pages 62 and 63, vegetation and area descriptions would suggest that there are some characteristics of Wetland Types 1, 2 or 3. This item should be reevaluated, including representative wildlife values, and the proper changes made on page 55.

On page 66, Game Resources, reference to northern limit of fishing should include fair fishing in the Tennessee portion of the watershed for black bass, rockbass, sunfish and catfish. It is unlikely that sauger would run up to the upper reaches of Cypress Creek and its tributaries. Suckers and some white bass do run up to these areas. Wading is the only way to fish these areas and is becoming more popular.

Deer hunting (page 67) is not classified as neglible in the Tennessee portion of the watershed. In 1974, there were 74 legal bucks reported and 659 big game stamps sold. Population densities are improving.

In this same section, some mention should be made of the aesthetic quality of game animals, and not relate their value for consumptive use only.

The section on Endangered/Threatened Species should be reevaluated to reflect the current status of various species. Specific examples include the status of the blenny darter and the tuscumbia darter. Recent Federal Register notices should be consulted as well as recent determinations by the states of Tennessee and Alabama. What other endangered/threatened species are noted in Boschung's report (page 77)?

Proper recognition of outdoor recreation is not made in the section on recreational resources (pages 78-79). The Natchez Trace Parkway and recent actions by the Tennessee Department of Conservation would indicate otherwise. It should be noted that stream recreation would be impacted as streams are dammed with floodwater retarding structures and channel alterations are made. Major alterations to streams in Tennessee would essentially eliminate the stream from state-designated recreation river in that state.

What is the relationship of the actual flood damage occurring each year with that suggested by a "100-year frequency flood" area of 10,321 acres? What precent of the corn, cotton, soybeans, pastureland, forestland, and idle land is being damaged each year (1- and 2-years flood)? How much of the channel damage is the result of landowners (-users) removing the protective cover? How are the landowners disposing of brush removed from along the channels? What influences do bridges and culverts in the watershed have on permitting high flows to pass without being obstructed and flooding the adjacent floodplain? (Section on floodwater damage, pages 86-91).

The problems associated with erosion damage (page 91-92), sediment damage (page 92-94) and drainage problems (page 95) point out the main problem in this watershed - poor land use and mismanagement in and out of the floodplain. They suggest where the main thrust should be with this project, that being stabilizing and controlling the erodible soils in the watershed. Comment has been made to show that structures can greatly assist in the preservation of stream flow capabilities without channel modifications (pages 71 and 89). This conclusion would support TWRA's suggestion that channel modifications should follow accelerated land treatment and the later floodwater retaining structures.

On pages 97 and 101, recreational resources available in the watershed, two additional recreation areas might be included - portions of Hassell & Hughes Wildlife Management Area (total 31,438 acres) and Tennessee River Pulp & Paper Wildlife Management Area (total 13,559 acres). Additionally, the presence of recreational facilities on Tennessee River and its lakes does not remove the need for small stream public recreation.

Plant and Animal Problems (page 97) indicate no significant changes in plant communities. This evaluation is questionable when on page 105 the table indicates an increase of 9.7% in cropland, 5.6% percent increase in pastureland, 23.9% decrease in forestland, 100% decrease in idle land and no change in miscellaneous - all percentages based upon comparisons with and without the project within the 10,321 acre floodplain. Depending on where these changes occur, impacts could be substantial.

Do "gross sales figures" relate to all farms or only farms actually operated as a commercial enterprise? Is the farm enterprise supplementing other employment or is the reverse true? To what year do the unemployment rates apply? How will this project provide long term unemployment relief? (Economic and Social Problems, page 99).

Pages 102 to 131 outline the impacts of various activities - land use changes, floodwater retarding structures, proposed land treatment measures, erosion control and treatment of critically eroding areas.

Following are specific questions to this section.

1. Does this project, as planned, reduce flooding from a 100-year frequency by only 25.4 percent? Various benefits and losses are based upon annual floods or 100-year frequency floods in the DEIS, depending on the situation. (page 105)

2. How will this project improve yields as shown in the table on page 106? What percent of these crops are affected by various flood categories?

3. The loss of forest land is more than a "minor effect". Wood ducks also nest along portions of streams in the watershed. What management guidelines will be used to retain the important mast and den trees? (page 107)

4. Will land treatment measures reduce sheet erosion rates by only 9 percent? This being an obvious cause of stream degradation, reduction should be much higher. (page 108)

5. How will structural measures benefit 10,321 acres if 7,700 acres would still be flooded with a 100-year frequency flood? (page 109)

6. How would cropland be reduced when the table on page 105 shows an increase of 9.7 percent for cropland, 5.6 percent increase for pastureland, 23.9 percent decrease for forestland, and 100 percent decrease for idle land? The potential is increased pesticide problems rather than reduced since there is more cropland and a landowner desire to increase farming intensity. (page 111)

7. Although the aesthetic appeal of some portions of streams might be improved, some structural measures on streams can detract from this appeal as suggested by the Academy of Natural Sciences while reviewing a similar watershed project.

8. What assurances can be made to ensure public access to water areas for nature study?

9. Page 27 refers to six streams as flowing at all times except during extreme drought conditions. Would this characteristic contradict the comment of "all but one . . . intermittent streams" on page 113?

10. The current status of the endangered threatened species on pages 114 to 117 should be checked.

11. Stream length is not as serious as removing fish shelter of streamside vegetation resulting from the project or future landowner activity. (page 117-118)

12. What were the watershed projects studied by University of Georgia which provided no significant adverse or beneficial ecological impacts? List of references lacking. (page 119)

13. The reduction of silt in the streams and the application of certain land management programs are certainly beneficial; however, without certain long-term maintenance their benefits will not replace the potential habitat lost by various structural measures.

14. It would appear that some of the suggested economic and social benefits resulting from this project are overly optimistic. What have been the documented benefits from other projects? (pages 122 to 128)

15. The addition of 5 acres of field border vegetation is insignificant if the entire floodplain of 10,531 acres is considered. (page 126)

16. Favorable Environmental Effects - pages 129-130

    a. Will conservation land treatment measures adequately protect the land with the landowners intent to convert more of the floodplain into cropland and pasture? Protection with more intensive farming methods? (#4)

    b. There will be a higher probability of fertilizer and pesticides entering the streams considering the above. (#5 and 8)

c. Numbers 12, 13, 14, 15 and 16 may be true with annual floods, but floods of 2-year frequency to 100-year frequency will not result in reduction of damages to the degree stated.

d. What assurances can be given that the 78 ponds proposed in conservation land treatment will be anything more than unmanaged bodies of water? The quality of habitat is proportional to the applied management. (#20)

e. Numbers 21, 22, and 23 are not necessarily favorable environmental impacts - they are more social/ well-being spinoffs, the last two being short-term.

17. Adverse Environmental Impacts - pages 130-131

a. There would be a permanent loss of vegetation of the type now growing on the 420 acres needed for dams and spillways. The re-vegetation might not be of the same type now growing. (#4)

b. Numbers 5, 6, and 7 are similar to Item 16e in that these are social/well-being spinoffs, not environmental impacts.

c. There would be a permanent loss of wildlife of a type now present on construction sites. Some other types (species) might "move in" after construction, but would not be the same species as previously. (#8)

d. The loss (potential or actual) of some previously recognized endangered or threatened species was not included in this section of adverse impacts. This would definitely be an adverse impact if an endangered species or its habitat were adversely affected.

A multi-agency study was suggested and preliminary plans were formulated in 1971 to determine the effects of channelization and other watershed development on wildlife habitat and populations in the Cypress Creek Watershed. This study was to involve representatives of SCS, Fish and Wildlife Service, Alabama Department of Conservation and Tennessee Wildlife Resources Agency. What are the results of this study, and if satisfactory progress has been made, how do the study conclusions compare with the objectives of this proposed project?

Of concern to TWRA is the lack of input from various agencies in Tennessee. This would include TWRA which has current information on fish and wildlife populations and recreational use. The publication, An Appraisal of Potentials for Outdoor Recreation - Wayne County, is an example and should be reviewed and referenced. If wildlife habitat improvement is to be a part of this project, TWRA must be represented in the early stages as well as the later stages.

The potential for changes in the populations and/or habitat for mosquitoes and other arthropods of importance to human health and recreation is not discussed. The "benefits" claimed for recreation and social well-being could be overly optimistic if annoying insects reach high population levels. This matter should be included in this statement.

Considering the total potential impact of this project in Tennessee, the Tennessee Wildlife Resources Agency recommends the following alternatives in order of preference.

Preference 1: Accelerated Conservation Land Treatment Measures Only

Preference 2: Accelerated Conservation Land Treatment and Floodplain Zoning

Preference 3: No project.

Preference 4: Accelerated Conservation Land Treatment, 19 Floodwater Retarding Structures, and Flowage Easements

No other alternatives would be applicable to Tennessee.

Thank you for permitting us to comment on this important project.

Sincerely,

Harvey Bray, Executive Director
Tennessee Wildlife Resources Agency

Larry E. Safley

Larry E. Safley, Environmental Planner
Planning & Environmental Resources Division

LES/ss

cc: Mr. Larry McGinn
Mr. Ed Penrod
Mr. Doug Pelren

The University of Tennessee
INSTITUTE OF AGRICULTURE

Agricultural Experiment Station
P.O. Box 1071
Knoxville, Tennessee 37901

April 15, 1975

Mr. W. B. Lingle
State Conservationist
P. O. Box 311
Auburn, Alabama

Dear Mr. Lingle:

We have examined the "Draft Environmental Impact Statement for Cypress Creek Watershed," for Lauderdale County, Alabama and Wayne County, Tennessee and have no comments to add.

Sincerely,

John A. Ewing
Dean

Alabama Archaeological Society

Standing Rock, AL 36878
May 25, 1975

Mr. W.B. Lingle
State Conservationist
P.O. Box 311
Auburn, AL 36830

Dear Mr. Lingle,

Thank you very much for sending me the copies of the draft environmental impact statements for the Soil Conservation projects in Escambia and Lauderdale Counties.

Mr. David DeJarnette has always conducted very thorough surveys. These appear to be up to his usual high standards.

I cannot emphasize too strongly, the necessity to watch for additional sites as land clearing and soil removal progresses. It is important that an archaeologist has the opportunity to visit these sites before they are destroyed by land altering operations.

Sites are usually indicated by a dark rich "midden" soil layer or concentrations of worked stone or pieces of pottery. Often storage pits, post molds and burials will show up as dark areas when the soil has been freshly scraped from the surface. This difference in soil color will not be nearly so apparent after the surface has dried or been exposed to the action of rain and sun. Burned trees and forest fires also leave dark spots therefore it is important that an archaeologist study these indications.

A new law was passed by Congress last year. Known as the Moss-Bennett Bill, it is now P.L. 93-291. While the funding has not been set up under the new law, the standards for archaeological assessment for the EIS follow the new requirements. Now any project which receives Federal money, whether wholly or in part, must be cleared as to the effect of the project upon the archaeological resources. This will cover a wider range of construction such as relocation or building of roads, soil borrow pits, quarrys, shop areas and camp areas for the workmen. This is a much wider range of activities and many agencies do not yet realize the broad scope of the impact statement now required by law.

I wish to compliment you for compiling very comprehensive reports for these two watershed projects. I am sure the Soil Conservation Service realizes the importance of recording the archaeological sites and will continue to call upon the professional archaeologists for advice and consultation.

Very truly yours,

Marjorie Gay

(Mrs Robert) Marjorie Gay, President
Alabama Archaeological Society

TENNESSEE CHAPTER
THE WILDLIFE SOCIETY

June 2, 1975

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Re: Draft Environmental Impact Statement for Cypress Creek Watershed; Lauderdale, Alabama, and Wayne County, Tennessee

Dear Mr. Lingle:

The Tennessee Chapter of The Wildlife Society takes this opportunity to offer comment concerning the draft environmental impact statement for the Cypress Creek Watershed Project in Lauderdale County, Alabama and Wayne County, Tennessee. Members of the chapter have reviewed this document and consider its content is of such importance that comment could be beneficial to the project.

It is understood that this project, involving 135,360 acres of watershed which includes 10,321 acres of floodplain, would total approximately 50,370 acres in Tennessee and 84,900 acres in Alabama. The project would provide watershed protection and flood prevention. Activities include accelerated conservation land treatment, 19 floodwater retarding structures, and 14.4 miles of channel work. Channel work would include bedload removal, clearing and shaping, and some limited new channel excavation. Seven alternatives were considered for obtaining the desired results.

While summarizing the flood control project, the statement notes landowner intentions of expanding the cropland and pasture acreage and more intensively farming existing acreage. Within the body of the report, the statement discusses the present erosion/siltation problems and current and past farming practices as they relate to these problems. Based upon these comments and the fact that S.C.S. does not have the authority for making final decisions on land management activities, it would appear that anticipated land use practices would negate many of the potential gains attributed to this project. This result would be at the expense of several hundreds of acres of potential wildlife habitat, both terrestrial and aquatic. The acreage noted as being improved and/or developed for wildlife will in no way replace the acreage lost as a direct result of this project or the secondary losses resulting from additional encroachment on the floodplain. It should be noted that nearly 1,400 acres in Wayne County are presently under the Cropland Adjustment Program, a program offering monetary consideration for <u>not</u> planting various lands.

Assuming accelerated conservation land treatment measures are initiated, what assurance can be offered that this activity would be continuously monitored and maintained? One stream is noted as having been treated by man several years ago. However, this stream is also currently noted as needing new treatment to provide unobstructed stream flows. What assurance can be given that the improved streams will not become clogged with sediment in future years?

Reference is made to the provision of public recreation with the completion of this project. However, with the landowner having final responsibility for structures on his land, the recreational opportunity would be of local (personal?) importance only unless public access is provided. Knowledge of landowner attitudes toward public recreation is necessary before the potential of recreation can be recorded as a benefit of the project.

The statement states that no wetlands, as described by the Fish and Wildlife Service bulletin describing such areas, exists in the project area. However, as noted further on in the report, some swamp areas are characterized by having cattails, sedges and other aquatic-type plants in the area. It is suggested that the conclusion that no wetland areas are present should be reexamined and corrected. Such areas should not be filled with material removed from the stream channels. This suggestion would be applicable to any area providing habitat for fish and other aquatic-associated organisms.

The headwaters of the Cypress Creek watershed in Tennessee offer more wildlife habitat and public recreation than is generally recognized in the statement. A total of 74 legal deer were recorded and 659 big game stamps were sold during the 1974 hunting season. In addition, small game and forest game hunting is locally popular.

Stream fishing is popular locally and would be referenced as fair for bass, sunfish, rockbass and catfish. Care should be taken when stating the increase of reservoir fishing - such increases would be at the partial expense of stream fishing. In some aspects, substantial reservoir fishing is available now without creating more such habitat at the expense of stream fishing.

The section concerning endangered/threatened species should be reevaluated in light of the current status of those species referred to and those species not specifically listed in the statement. All endangered/threatened species recorded as potentially present in the area by the Fish and Wildlife Service and the two states should be listed. Such listing would be those species on federal and state lists. Every effort should be made to prevent any avoidable loss of habitat of species categorized as endangered or threatened. This section should be summarized in the listing of detrimental impacts toward the end of the statement.

As viewed by the Tennessee Chapter of The Wildlife Society, this watershed project has the potential for substantially improving the Cypress Creek Watershed with emphasis on the following points.

1. Accelerated Conservation Land Treatment - such action should emphasize the stabilization of areas subject to erosion and siltation. Descriptions of the flood problems point out the past misuse of the watershed and floodplain which has permitted the stream channels to become clogged with rock and soil materials. Trees, rock ledges and similar materials should be removed only after an appraisal by fisheries biologists of the states and federal government (Fish and Wildlife Service and S.C.S.). Habitat for aquatic life is essential, not only for the stream in question but also for those waterways downstream.

2. Land treatment should adequately recognize and include in proposed activities inclusions for wildlife habitat development. Such areas must be protected from grazing or similar impacts in order that the areas might attain their full potential. The acreage noted in the statement will in no way mitigate the recognized potential losses.

3. The full potential of the watershed project will not be achieved if continued detrimental floodplain development and encroachment is permitted. Protective guidelines to prevent this mismanagement and stream degradation are needed and are recommended. The reductions of sediment and surface runoff noted on the statement should be the minimum amounts accepted. Continued monitoring of the watershed should effectively point out areas where more intensive land management will reduce further the area's detrimental environmental impacts, especially within stream channels.

Based upon the information discussed in this statement, the Tennessee Chapter of The Wildlife Society recommends the following alternatives in order of preference.

1st: Accelerated Conservation Land Treatment Measures and Flood Plain Zoning

2nd: Accelerated Conservation Land Treatment Measures

3rd: Accelerated Conservation Land Treatment Measures and 19 Structures

The Chapter strongly suggests that floodwater retarding structures not be installed until documentation is made to indicate that land conservation treatment measures are not favorably stabilizing the watershed. Streamside zoning, directed toward preventing encroachment upon the flood hazard area, should provide wildlife habitat while providing a buffer strip between agricultural operations and the streams.

Stream channel work should follow the installation and evaluation of floodwater retarding structures. It has been shown that some watersheds responded favorably when land treatment and structural work prevented new siltation while streamflows removed existing obstructing bedload. Streams treated in this manner made their own natural meanders, pools and riffles without man's influence.

Thank you for permitting this organization the opportunity to comment on this important project.

Sincerely,

Larry Richardson

Larry Richardson, President
Tennessee Chapter
The Wildlife Society

LR/ss

2630 Cahaba Road
Birmingham, Alabama 35223
March 8, 1975

W. B. Lingle, State Conservationist
U. S. Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

The following comments are for the record on the Cypress Creek Watershed project and are based on the Draft Environmental Impact Statement dated December 1974.

I am very much opposed to "channel work", planned for 14.4 miles of major streams in this project. It is well known and documented by extensive studies that stream channelization as planned for this project destroys wildlife habitat, causes damage to streambanks and their biological communities, lowers water tables, and aggravates downstream flooding conditions. Channelization of streams should not be considered as an appropriate technique in watershed development.

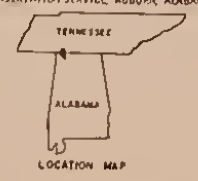
Naturally yours,

Bob Truett

FBT/lh

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA



LOCATION MAP

DA 107 AC
DA 742 AC
DA 2,138 AC
DA 4,230 AC
DA 960 AC
DA 3709 AC
DA 2,212 AC
DA 3,309 AC
DA 3,642 AC
DA 3,620 AC
DA 1,178 AC
DA 3,827 AC
DA 1,664 AC
DA 4,608 AC
DA 2,790 AC
DA 12,179 AC PLUS CONTROLLED 7,872 AC
DA 1,696 AC
DA 915 AC
DA 2,976 AC

Reach I
Reach II
Reach III
Reach IV
Reach V
Reach VI
Reach VII
Reach VIII
Reach IX
Reach X
Reach XI
Reach XII
Reach XIII
Reach XIV
Reach XV
Reach XVI
Reach XVII
Reach XVIII
Reach XIX
Reach XX
Reach XXI
Reach XXII
Reach XXIII
Reach XXIV

Sta 357+00
Sta 410+00
Sta 391+00
Sta 369+00
Sta 430+00
Sta 418+00
Sta 437+00
Sta 476+00
Sta 447+00
Sta 451+00
Sta 495+00
Sta 541+00
Sta 533+00
Sta 537+00
Sta 557+00
Sta 563+00
Sta 588+00
Sta 606+00
Sta 616+00
Sta 600+00
Sta 641+00
Sta 652+00
Sta 623+00
Sta 715+00
Sta 682+00
Sta 645+00
Sta 691+00
Sta 738+00
Sta 721+00
Sta 827+00
Sta 716+00
Sta 636+00
Sta 806+00
Sta 828+00
Sta 977+00
Sta 713+00
Sta 919+00
Sta 964+00
Sta 992+00
Sta 1032+00
Sta 1047+00
Sta 965+00
Sta 1176+00
Sta 1247+00

WAYNE CO.
LAUDERDALE CO.
TENNESSEE
ALABAMA

Sharps Mill Pond
Cypress Creek
North Florence
Florence
Zip City
St. Florian
Mars Hill
Loretto
Crossroads
Waterloo
Collinwood
Leighton
Killen
Rogersville
Pleasant Grange Ch.
Mt. Hope Ch.
Sugar Creek Ch.
Cedar Hill Cem.
Mars Hill Cem.
Pisgah Ch.
Pleasant Hill Ch.
Mt. Gilead Ch.
Mt. Zion Ch.
Mt. Pleasant Ch.
Mt. Moriah Ch.
Mt. Olive Ch.
Mt. Carmel Ch.
Mt. Sinai Ch.
Mt. Hebron Ch.
Mt. Nebo Ch.
Mt. Tabor Ch.
Mt. Vernon Ch.
Mt. Olivet Ch.
Mt. Pisgah Ch.
Mt. Zion Cem.
Mt. Pleasant Cem.
Mt. Moriah Cem.
Mt. Olive Cem.
Mt. Carmel Cem.
Mt. Sinai Cem.
Mt. Hebron Cem.
Mt. Nebo Cem.
Mt. Tabor Cem.
Mt. Vernon Cem.
Mt. Olivet Cem.
Mt. Pisgah Cem.

LEGEND

- DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE LAND VARYING IN WIDTH ALONG EACH SIDE OF NATCHEZ TRACE PARKWAY
- PAVED ROAD
- IMPROVED ROAD
- UNIMPROVED ROAD
- (72) FEDERAL HIGHWAY NUMBER
- (57) STATE HIGHWAY NUMBER
- POWER LINE
- PIPELINE
- RAILROAD
- STATE LINE
- DRAINAGE
- WATERSHED BOUNDARY
- DRAINAGE AREA CONTROLLED BY STRUCTURE
- AREA BENEFITED
- FLOODWATER RETARDING STRUCTURE
- NEW CHANNEL EXCAVATION
- REDLOAD REMOVAL
- CLEARING AND SHAPING
- EVALUATION REACH
- (8) STRUCTURE NUMBER
- DA 915 AC DRAINAGE AREA ACREAGE
- FLORENCE CITY LIMITS
- TVA (TENNESSEE VALLEY AUTHORITY) PROPERTY

LATITUDE AND LONGITUDE LINES ARE APPROXIMATE

PROJECTION UNKNOWN

(PICKWICK LAKE) TENNESSEE RIVER

Appendix C

PROJECT MAP

CYPRESS CREEK WATERSHED

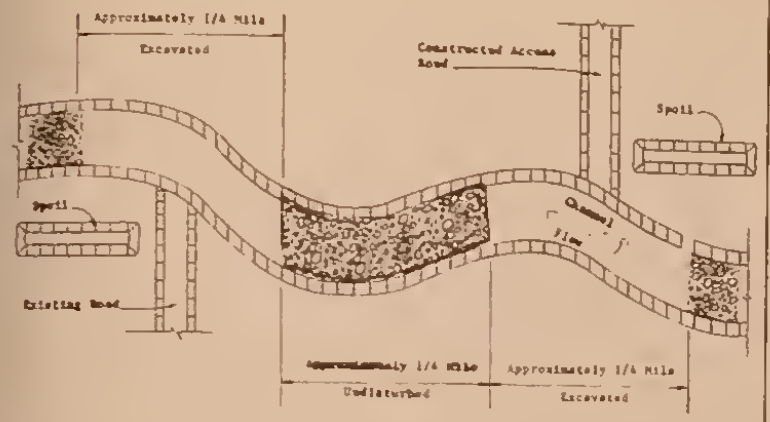
LAUDERDALE COUNTY, ALABAMA AND
WAYNE COUNTY, TENNESSEE

REVISED OCTOBER 1974 4-R-2900

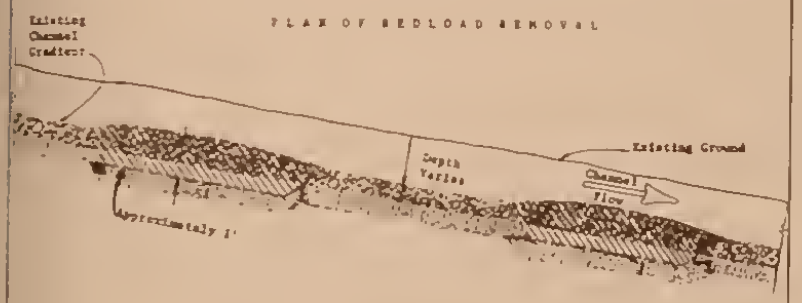
(Formerly 2-R-11065) 1-67 4-R-2333

CHANNEL WORK

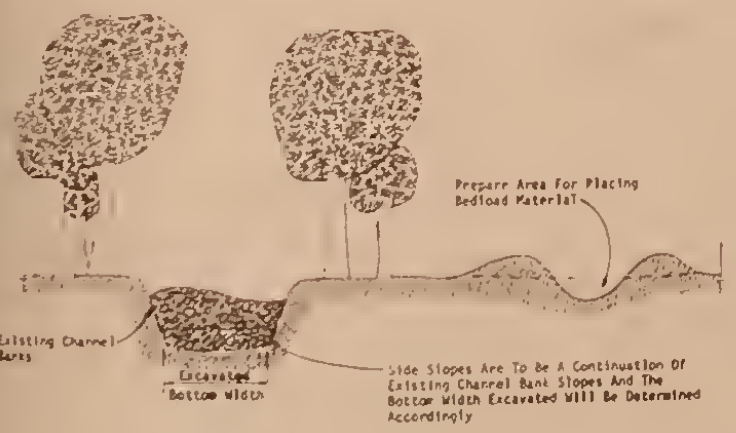
BEDLOAD REMOVAL



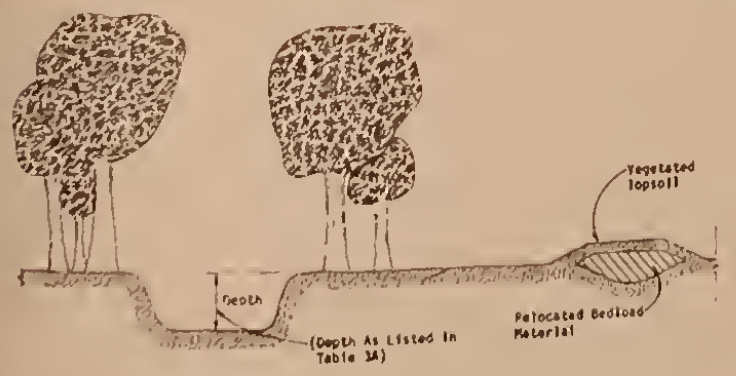
PLAN OF BEDLOAD REMOVAL



PROFILE ALONG ℄ OF CHANNEL REQUIRING BEDLOAD REMOVAL

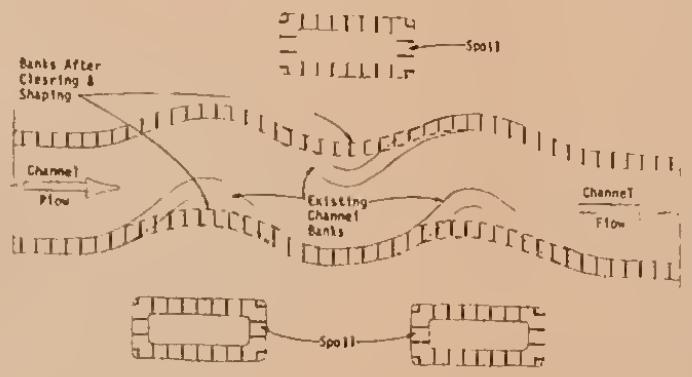


TYPICAL CROSS-SECTION WHERE BEDLOAD IS EXCAVATED



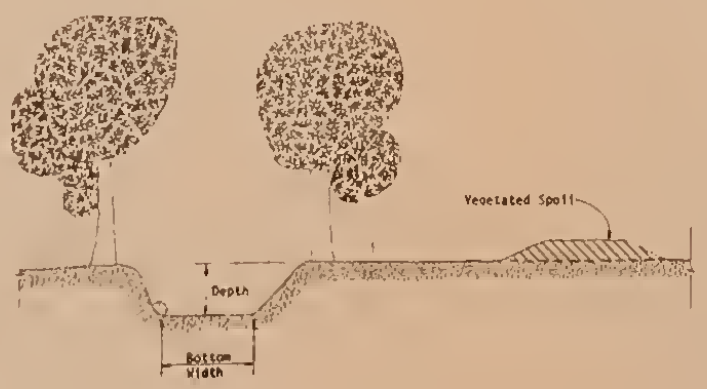
COMPLETED CROSS-SECTION OF BEDLOAD REMOVAL

CLEARING & SHAPING



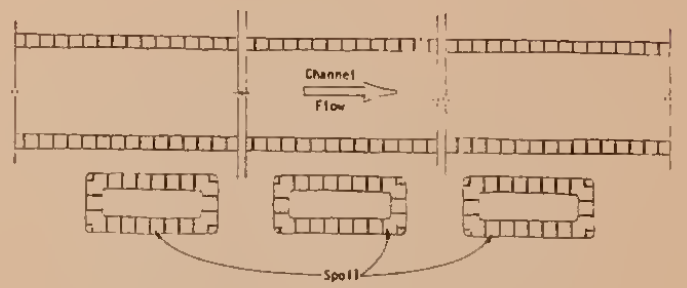
PLAN OF CLEARING & SHAPING

TYPICAL CROSS-SECTION REQUIRING CLEARING & SHAPING

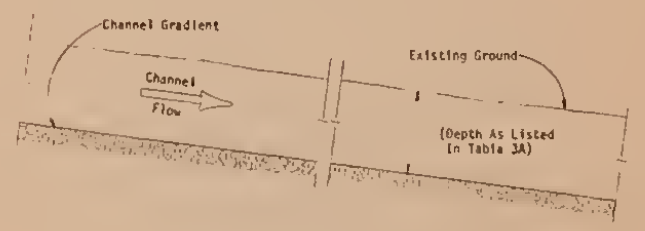


COMPLETED CROSS-SECTION OF CLEARING & SHAPING

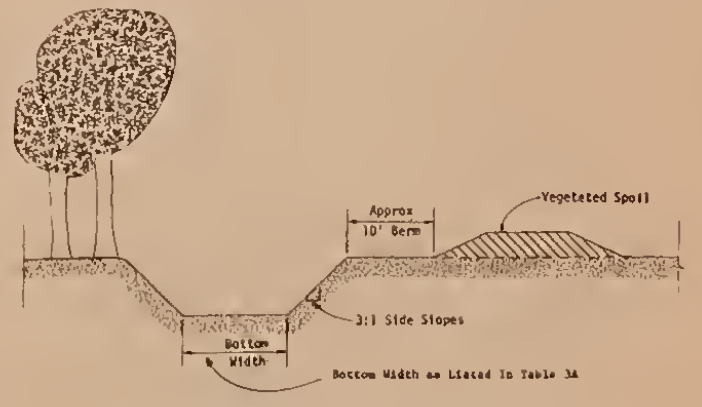
NEW CHANNEL EXCAVATION



PLAN OF NEW CHANNEL EXCAVATION



PROFILE ALONG ℄ OF NEW CHANNEL EXCAVATION



TYPICAL CROSS-SECTION OF COMPLETED NEW CHANNEL EXCAVATION

TYPICAL SECTIONS OF CHANNEL WORK

APPENDIX D FIGURE 9

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

LEGEND

- PAVED ROAD
- IMPROVED ROAD
- UNIMPROVED ROAD
- (72) FEDERAL HIGHWAY NUMBER
- (57) STATE HIGHWAY NUMBER
- POWER LINE
- PIPE LINE
- DRAINAGE
- WATERSHED BOUNDARY

LEGEND

1. DICKSON-BODINE-SAFFELL association
2. DICKSDN association
3. BODINE-DEWEY-DICKSDN-FULLERTDN association
4. DEWEY-DECATUR-DICKSDN association
5. LOBELVILLE-LEE-ETDWAH PRUITTDN association
6. CHOCCDLDCCO-CHENNEBY-STASER association

N

Appendix E

SOIL ASSOCIATION MAP

CYPRESS CREEK WATERSHED

PORTIONS OF

LAUDERDALE COUNTY, ALABAMA

WAYNE COUNTY, TENNESSEE

0 2 4

Approximate Scale - Miles

Albers Equal Area Projection compiled and reproduced at 1:115,200 or 1 inch equals 1.80 Miles.

Base compiled from USGS Quadrangle sheets.

LATITUDE AND LONGITUDE LINES ARE APPROXIMATE

USDA-SCS-FORT WORTH, TEX. 1974

April 1974 4-R-33824-A

(Formerly 2-R-11065) 1-67 4-R-23334

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

LOCATION MAP

Appendix F

LAND USE MAP
CYPRESS CREEK WATERSHED

PORTIONS OF

LAUDERDALE COUNTY, ALABAMA
WAYNE COUNTY, TENNESSEE

0 2 4

Approximate Scale - Miles

Albers Equal Area Projection compiled at 1:57,600 or (1 inch equals .9 Miles) and reproduced at 1:115,200 (1 inch equals 1.8 Miles).

Base compiled from USGS Quadrangle sheets.

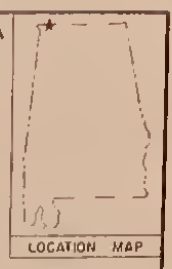
LATITUDE AND LONGITUDE LINES ARE APPROXIMATE

April 1974 4-R-33,836

(Formerly 2-R-11065) 1-67 4-R-23334

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA



LEGEND

Tabulation of Critically Eroding Areas, Cypress Creek Watershed

LOCATION NO.	TYPE OF AREA	1000'S SQ. FT.
1	Roadbank	8.0
2	Roadbank	6.0
3	Roadbank	8.0
4	Roadbank	10.0
5	Roadbank	4.0
6	Roadbank	7.5
7	Roadbank	15.0
8	Roadbank	7.5
9	Roadbank	4.0
10	Roadbank	6.0
11	Roadbank	5.0
12	Gullies & Borrow Pits	261.4
13	Gullies & Borrow Pits	217.8
14	Gullies & Borrow Pits	4.5
15	Gullies & Borrow Pits	87.1
16	Gullies & Borrow Pits	12.0
17	Gullies & Borrow Pits	7.5
18	Gullies & Borrow Pits	435.6
19	Roadbank	30.0
20	Roadbank	30.0
21	Roadbank	6.0
22	Roadbank	4.0
23	Roadbank	6.0
24	Roadbank	10.0
25	Gullies & Borrow Pits	87.1
26	Roadbank	11.0
27	Gullies & Borrow Pits	87.1
28	Roadbank	4.5
29	Gullies & Borrow Pits	87.1
30	Roadbank	50.0
31	Gullies & Borrow Pits	348.5
32	Gullies & Borrow Pits	87.1
33	Gullies & Borrow Pits	261.4
34	Gullies & Borrow Pits	87.1
35	Roadbank	4.5
36	Roadbank	9.0
37	Roadbank	15.0
38	Gullies & Borrow Pits	130.7
39	Roadbank	6.0
40	Roadbank	15.0
41	Roadbank	6.0
42	Roadbank	4.5
43	Roadbank	4.5
44	Roadbank	9.0
45	Roadbank	9.0
46	Roadbank	6.0
47	Roadbank	6.0
48	Roadbank	6.0
49	Roadbank	6.0
50	Roadbank	6.0
51	Roadbank	6.0
52	Roadbank	13.0
53	Roadbank	7.5
54	Roadbank	13.0
55	Roadbank	15.0
56	Roadbank	5.0
57	Roadbank	9.0
	Total	60 Acres

Appendix G

CRITICALLY ERODING AREAS

CYPRESS CREEK WATERSHED

PORTIONS OF

LAUDERDALE COUNTY, ALABAMA

WAYNE COUNTY, TENNESEE

0 2 4

Approximate Scale - Miles

Albers Equal Area Projection compiled and reproduced at 1:115,200 or 1 inch equals 1.80 Miles.

Base compiled from USGS Quadrangle sheets.

April 1974 4-R-33821-A

(Formerly 2-R-11065) 1-67 4-R-23334

USDA-SCS-FORT WORTH, TEX. 1974

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

LEGEND

1. Areas underlain by thick sections of sands, gravels, and clays (Coastal Plains). The yield, depth and static head are variable. Yields range from 40 to 500 GPM. Depth ranges from 200 to 500 feet. Water is generally of good quality.

2. Areas underlain by cherty regolith and/or less than 100 feet of sands, gravels and clays (Highland Rim). Springs are numerous and have estimated flows of 25 to 200 GPM. Yields water to shallow wells mostly less than 10 GPM. Water is of good quality, locally high in chloride.

3. Areas underlain by limestone of Fort Payne and Tuscumbia formations (Highland Rim). Most productive aquifer in the watershed. Water occurs in openings enlarged by solution along joints and bedding planes. Most water bearing openings are within 200 feet of land surface with the largest usually within 100 feet. Potential yields as high as 2,300 GPM in Cox Creek Valley. Water is of good quality but slightly hard.

Modified From: Ground-water of Alabama (map), 1955 and U. S. Geological Survey Water Supply Paper 677. Washington, 1936.

Appendix H

GROUND WATER AVAILABILITY MAP

CYPRESS CREEK WATERSHED

PORTIONS OF

LAUDERDALE COUNTY, ALABAMA

WAYNE COUNTY, TENNESSEE

N

0 2 4

Approximate Scale - Miles

Albers Equal Area Projection compiled and reproduced at 1:115,200 or 1 inch equals 1.80 Miles

Base compiled from USGS Quadrangle sheets.

LATITUDE AND LONGITUDE LINES ARE APPROXIMATE

April 1974 4-R-33822-A

(Formerly 2-R-11065) 1-67 4-R-23334

USDA-SCS-FORT WORTH, TEX. 1974

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

EXPLANATION

Ke	Eutaw Formation. Fine to medium sand with beds of sandy clay. Rolling, hilly topography.	Cretaceous
Kt	Tuscaloosa Group. Sands, clays, and gravel beds. Rolling, hilly topography.	Cretaceous
Mt	Tuscumbia Limestone. Gray, medium bedded, hard, cherty limestone. Rolling topography with deep gravelly soils.	Mississippian
Mfp	Fort Payne chert. Light gray, thin to medium-bedded, dense, hard, cherty limestone. Rolling to hilly topography with deep gravelly soils.	Mississippian

Geology Modified From: Geological Survey of Alabama County Report 8, University of Alabama, 1963 and U. S. Geological Survey Water-Supply Paper 677, Washington, 1936.

Appendix I

GEOLOGIC MAP

CYPRESS CREEK WATERSHED

PORTIONS OF

LAUDERDALE COUNTY, ALABAMA

WAYNE COUNTY, TENNESEE

N

0 2 4

Approximate Scale - Miles

Albers Equal Area Projection compiled and reproduced at 1:115,200 or 1 inch equals 1.80 Miles.

Base compiled from USGS Quadrangle sheets.

LATITUDE AND LONGITUDE LINES ARE APPROXIMATE

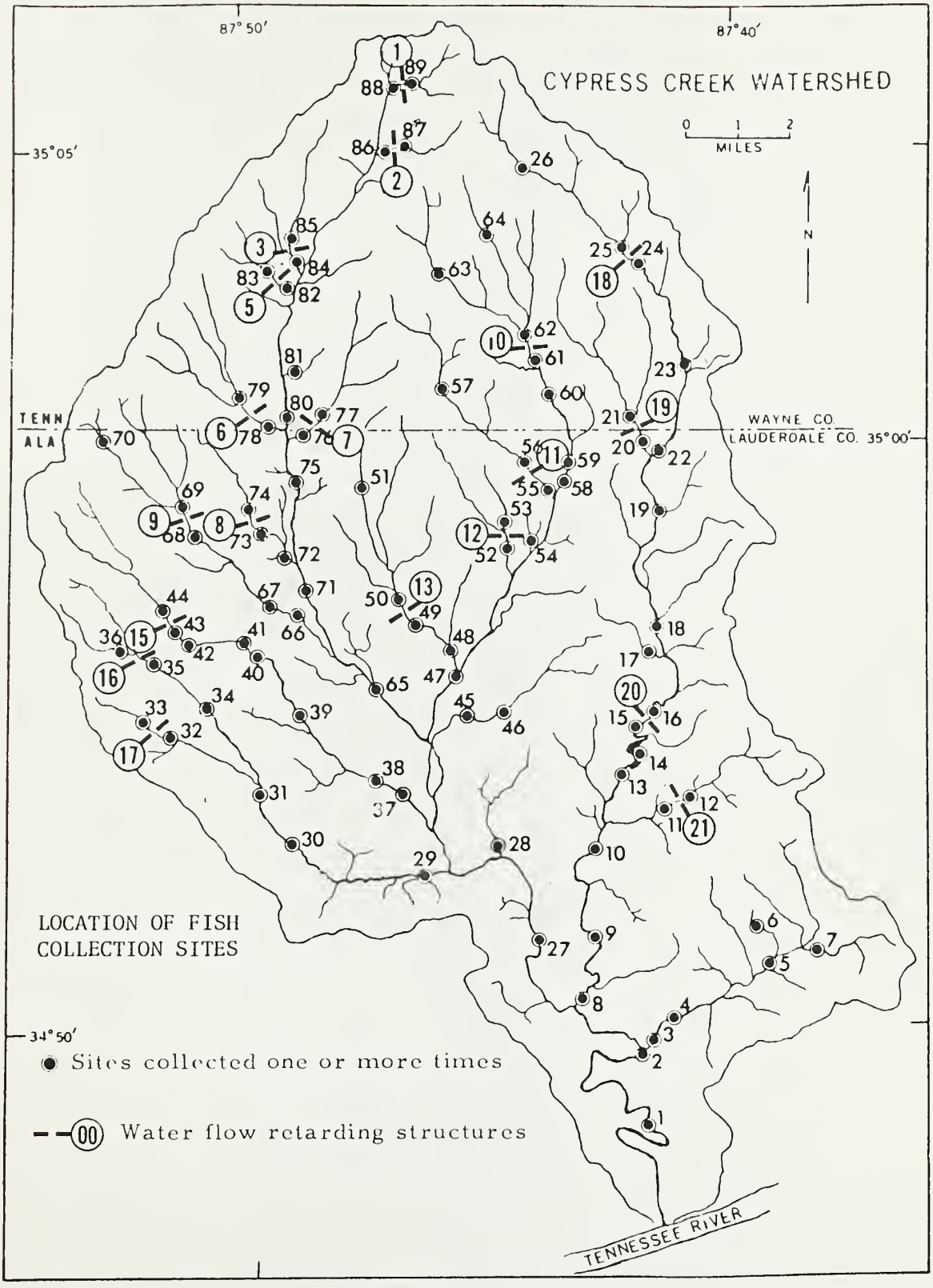
April 1974

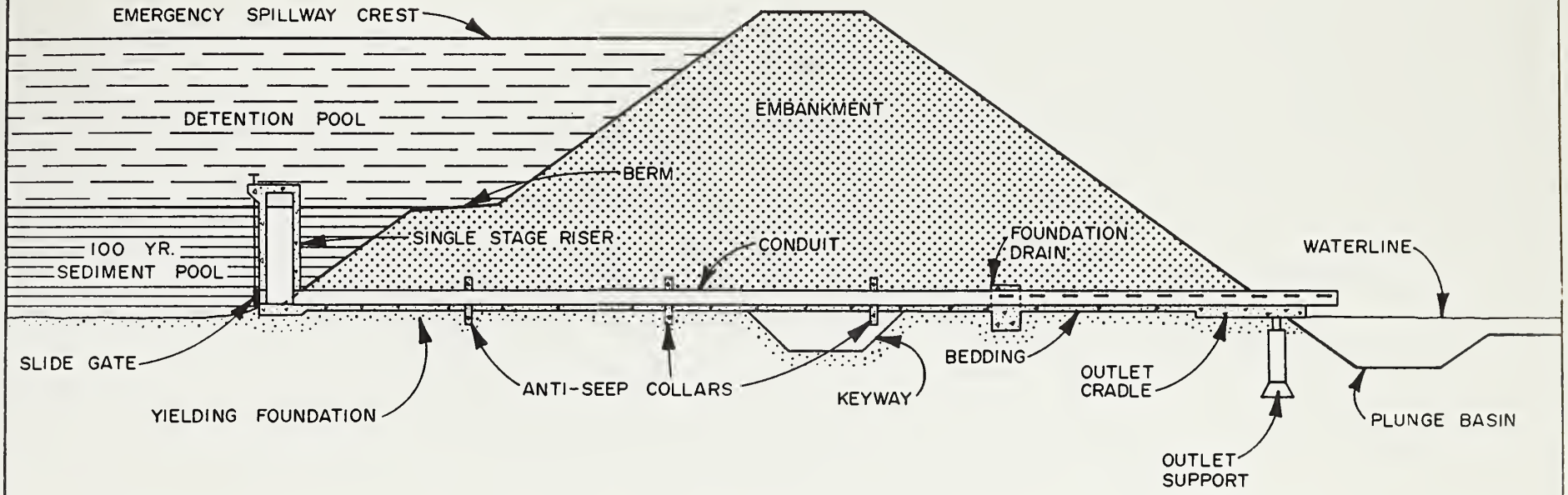
(Formerly 2-R-11065)

4-R-33823

1-67 4-R-23334

USDA-SCS-FORT WORTH, TEX. 1974

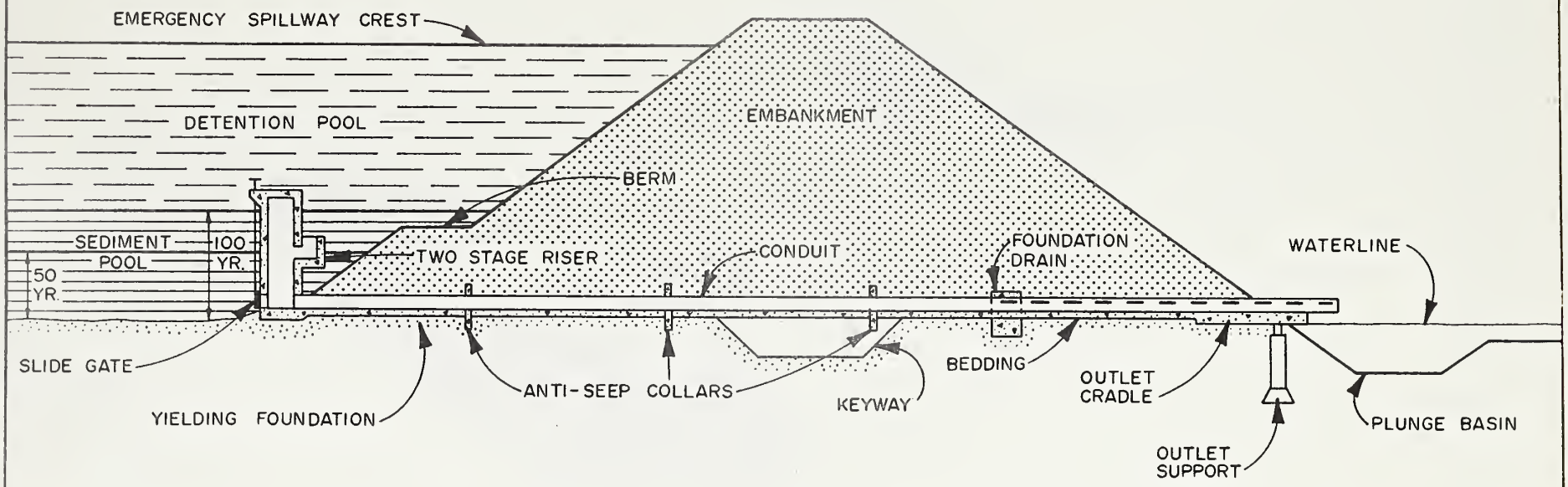

87° 50′
87° 40′
CYPRESS CREEK WATERSHED
0 1 2
MILES
N
35° 05′
TENN
ALA
WAYNE CO.
LAUDERDALE CO. 35° 00′
34° 50′
LOCATION OF FISH
COLLECTION SITES
Sites collected one or more times
00 Water flow retarding structures
TENNESSEE RIVER



SECTION OF A TYPICAL
FLOODWATER RETARDING STRUCTURE

(Single Stage Riser)

APPENDIX K

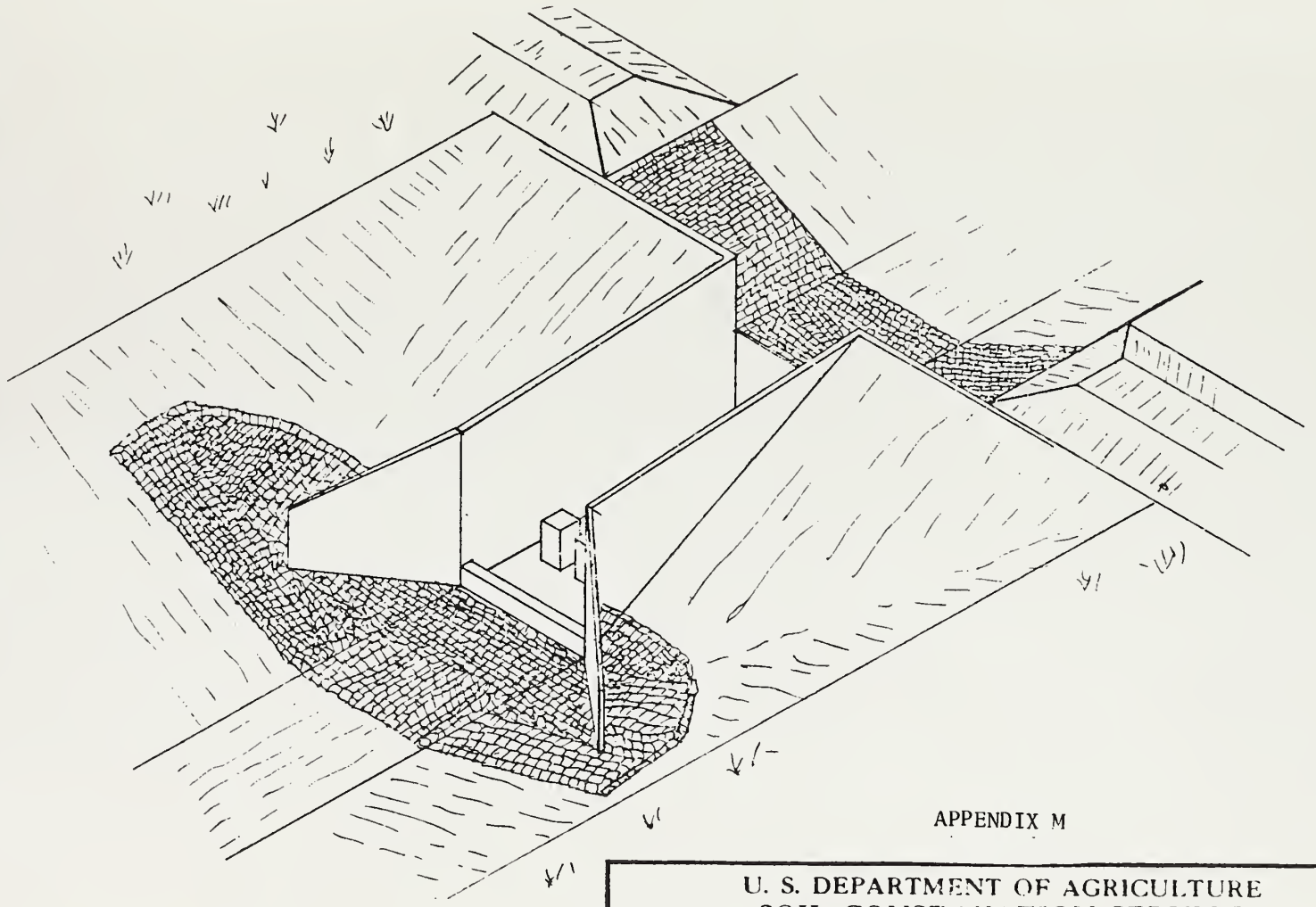


SECTION OF A TYPICAL

FLOODWATER RETARDING STRUCTURE

(Two Stage Riser)

APPENDIX L



APPENDIX M

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TYPICAL REINFORCED CONCRETE

DROP SPILLWAY